SONY®

DIGITAL VIDEOCASSETTE RECORDER

DSR-1500
DSR-1500P

DIGITAL INPUT/OUTPUT BOARD

DSBK-1501

i.LINK/DV INPUT/OUTPUT BOARD

DSBK-1503

ANALOG INPUT BOARD

DSBK-1504
DSBK-1504P

SERVICE MANUAL

Volume 1 1st Edition

DVCAM ™

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，
人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

Für Kunden in Deutschland

Entsorgungshinweis: Bitte werfen Sie nur entladene Batterien in die Sammelboxen beim Handel oder den Kommunen. Entladen sind Batterien in der Regel dann, wenn das Gerät abschaltet und signalisiert "Batterie leer" oder nach längerer Gebrauchsdauer der Batterien "nicht mehr einwandfrei funktioniert". Um sicherzugehen, kleben Sie die Batteriepole z.B. mit einem Klebestreifen ab oder geben Sie die Batterien einzeln in einen Plastikbeutel.

For the customers in the Netherlands
Voor de klanten in Nederland

Dit apparaat bevat een MnO_2-Li batterij voor memory back-up.

Raadpleeg uw leverancier over de verwijdering van de batterij op het moment dat u het apparaat bij einde levensduur afdankt.

Gooi de batterij niet weg. maar lever hem in als KCA.

Bij dit produkt zijn batterijen geleverd. Wanneer deze leeg zijn, moet u ze niet weggooien maar inleveren als KCA.

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

ADVARSEL

Lithiumbatteri - Eksplosjonsfare.
Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten.
Brukt batteri returneres apparatleverandøren.

Vorsicht!

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.

Ersatz nur durch denselben oder einen vom Hersteller empfohlenen ähnlichen Typ. Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

VARNING

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en likvärdig typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt gällande föreskrifter.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.
Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

VAROITUS

Paristo voi räjähtää jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.
Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

ADVARSEL!

Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

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Manual Structure

Purpose of this manual

This manual is the Service Manual Volume 1 for the digital videocassette recorder DSR-1500/1500P, the option boards Digital Input/Output Board DSBK-1501, i.LINK/DV Input/Output Board DSBK-1503 and Analog Input Board DSBK-1504/1504P.

This manual contains the maintenance information of this equipment, and servicing information necessary for parts replacement and adjustments.

Related manuals

In addition to this Service Manual Volume 1, the following manuals are provided.

- **Operation Instructions**
  DSR-1500/1500P (Supplied with equipment)
  Part number : 3-204-974-11 (English; for UC, CE)
  3-204-974-21 (French; for UC, CE)
  3-204-974-31 (German; for CE)
  3-204-974-41 (Italian; for CE)

  DSBK-1501 (Supplied with Model DSBK-1501)
  Part number : 3-205-071-01
  DSBK-1503 (Supplied with Model DSBK-1503)
  Part number : 3-205-073-01
  DSBK-1504/1504P (Supplied with Model DSBK-1504/1504P)
  Part number : 3-205-072-01

- **Servive Manual Volume 2 (Not Supplied with equipment)**
  Contains the semiconductor pin assignments, parts lists, block diagrams, board layouts and schematic diagrams.
  Part number : 9-955-245-21

- **"Semiconductor Pin Assignments" CD-ROM (Available on request)**
  This "Semiconductor Pin Assignments" CD-ROM allows you to search for semiconductors used in Communication System Solutions Network Company equipment.
  Semiconductors that cannot be searched for on this CD-ROM are listed in the service manual for the corresponding unit. The service manual contains a complete list of all semiconductors and their ID Nos., and thus should be used together with the CD-ROM.
  Part number : 9-968-546-XX

Contents

The following is a summary of all the sections for understanding the contents of this manual.

Section 1   Operating Instructions
Describes the contents of the operating instructions that is extracted from the DSR-1500/1500P Operation Manual.

Section 2   Installation
Describes the switch setting, menu setting and connection with the external equipment that are required when installing the equipment as a system.

Section 3   Service Overview
Describes the replacement of the parts, the locations of the main parts and boards, notes and so on.

Section 4   Error Messages
Describes the alarms and countermeasures to be displayed when the unit detects abnormality.

Section 5   Maintenance Menu
Describes the maintenance menu.

Section 6   Periodic Inspection and Maintenance
Describes the periodic inspection and cleaning procedure.

Section 7   Replacement of Mechanical Parts
Describes the replacement procedures and adjustment after replacement.

Section 8   Tape Path Alignment
Describes the adjustment procedures of tape path system.

Section 9   Adjustment When Replacing Board
Describes the electrical adjustments after replacement boards.

Section 10 Electrical Alignment
Describes the electrical adjustment of each board.

Trademark

Trademarks and registered trademarks used in this manual are follows.

• Windows is a registered trademark of Microsoft Corporation.

This section is extracted from operation manual.

3-204-974-11(1)

SONY

Digital Videocassette Recorder

Operating Instructions
Before operating the unit, please read this manual thoroughly and retain it for future reference.

DVCAM™ i.

DSR-1500/1500P

© 2000 Sony Corporation

Owner's Record

The model and serial numbers are located at the bottom. Record these numbers in the spaces provided below. Refer to them whenever you call upon your Sony dealer regarding this product.

Model No._____ Serial No._____

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

THIS APPARATUS MUST BE EARTHED.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.
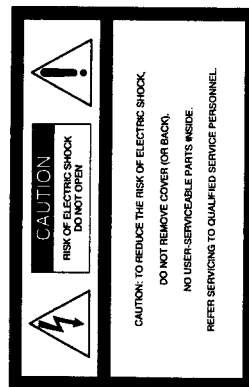
This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: THIS WARNING IS APPLICABLE FOR USA ONLY.
Using this unit at a voltage other than 120 V may require the use of a different line cord or attachment plug, or both. To reduce the risk of fire or electric shock, refer servicing to qualified service personnel.

For customers in the USA
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

Caution
Television programs, films, video tapes and other materials may be copyrighted.
Unauthorized recording of such material may be contrary to the provisions of the copyright laws.

For customers in Europe (DSR-1500P only)
This product with the CE marking complies with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.
Compliance with these directives implies conformity to the following European standards:
• EN60065: Product Safety
• EN55103-1: Electromagnetic Interference (Emission)
• EN55103-2: Electromagnetic Susceptibility (Immunity)
This product is intended for use in the following Electromagnetic Environment(s):
E1 (residential), E2 (commercial and light industrial), E3 (urban outdoors) and E4 (controlled EMC environment, ex. TV studio).

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Overview | Chapter 1

Features

The DSR-1500/1500P is a $1/4$-inch digital videocassette recorder using the DVCAM™ digital recording format. The unit is equipped with a full range of output interfaces, so that it can be used as a low-cost, compact feeder/viewer in a non-linear editing system* without requiring any optional boards.
When using the unit as a recorder, the optional boards available for the unit allow you to select required input signal formats.
The unit is playback-compatible with tapes recorded in DV format (excluding tapes recorded in LP mode) as well as DVCPRO (25 Mbps) format. Playing back such tapes on the unit does not require any adapter.
These and other features of the unit make it suitable for use under diversified conditions. It can be used, for example, for desk-top editing or for such applications as electronic news gathering (ENG) and non-linear editing aboard outside broadcast vans, at production houses or at broadcasting stations.

* Non-linear editing: This is an editing method that uses video and audio signals digitally encoded and recorded on a hard disk as digital data. When compared with conventional (linear) editing methods, non-linear editing offers vastly improved efficiency in editing operations, for example, by eliminating tape transport time.

The following are the principal features of the unit.

DVCAM Format

DVCAM is a professional $1/4$-inch digital recording format developed by Sony from the consumer DV component digital format.

High picture quality and high stability

Video signals are separated into color difference signals and luminance signals, which are encoded and compressed to one-fifth size before being recorded to ensure stable and superb picture quality.
Because the recording is digital, multi-generation dubbing can be performed with virtually no deterioration of quality.

Wide track

The recording track width is 15 μm, 50% wider than the 10 μm of the DV format. This ensures adequate reliability for professional use.

High-quality PCM digital audio

PCM recording makes for a wide dynamic range and a high signal-to-noise ratio, thereby enhancing sound quality.
There are two recording modes: 2-channel mode (48-kHz sampling and 16-bit quantization), which offers sound quality equivalent to the DAT (Digital Audio Tape) format, or 4-channel mode (32-kHz sampling and 12-bit quantization).

Superior playback compatibility with DV and DVCPRO (25 Mbps) formats

Tapes recorded in DV format (excluding the tapes recorded in LP mode) as well as DVCPRO (25 Mbps) format can be played back on this unit without requiring a cassette adapter. You can use the recordings on such tapes as source material for editing, applying such functions as the jog audio and digital slow-motion playback as required. Using the material, editing can be carried out to single-frame precision.

Note

When playing back a tape recorded in DVCPRO (25 Mbps) format, the outputs in SDTI and DV (i.LINK)

formats of this unit are muted. Furthermore, it is not possible to playback the cue-audio track of the tape.

Variety of Interfaces

Digital interfaces

The following optional digital interfaces are available for use with the unit.

• **SDTI (QSDI)* (optional DSBK-1501 Digital Input/Output Board):** When the unit is fitted with the optional DSBK-1501 board, SDTI (QSDI)-format video, audio and time code signals can be transferred between the unit and the Sony EditStation at normal speed. When this unit is connected to another DVCAM VCR, it is possible to copy compressed signals between the two VCRs. (You cannot use the SDTI (QSDI) and SDI (see next paragraph) interfaces at the same time. You can select either of the two using front panel buttons for input or with a menu item for output.)

• **SDI (serial digital interface)/AES/EBU (optional DSBK-1501 Digital Input/Output Board):** When the unit is fitted with the optional DSBK-1501 board, it can input and output D1 (component) format digital video and audio signals and also AES/EBU-format digital audio signals.

• **i.LINK (DV)** (optional DSBK-1503 i.LINK/DV Input/Output Board):** When the unit is fitted with the optional DSBK-1503 board, it can input and output digital video and audio signals in DV format.

* SDTI is the name of a standard interface established as SMPTE 305M. QSDI is a type of SDTI. This unit uses SDTI to transmit DV data, and the input/output connectors are labeled "SDTI (QSDI)."
** i.LINK and ⓘ are trademarks and indicate that this product is in agreement with IEEE 1394-1995 specifications and their revisions.

Analog interfaces

The unit can also use the following analog interfaces.

• **Analog video:** These interfaces include a component interface, composite interface, and S-video interface. The same BNC type input and output connectors are used to input and output signals in different formats selected with front panel buttons for input and menu items for output.

• **Analog audio:** The unit has two audio channels. When in 4-channel mode, you can input two channels of audio either as channels 1 and 2 or as channels 3 and 4. The two audio channels can be output also either as channels 1 and 2 or as channels 3 and 4.

The analog output interfaces are provided as standard so that the unit can readily be used as a viewer, for example, at broadcasting stations and aboard outside broadcast vans without requiring any optional boards.
Inputting analog video and audio signals requires the optional DSBK-1504/1504P Analog Input Board.

Compact Size

The compact size of the unit makes the unit suitable for use as a desk-top editor or feeder machine for non-linear editing or as a viewer compatible with a full range of digital and analog signal formats aboard an outside broadcast van.

Menu System for Functionality and Operation Settings

The unit provides a menu system to make its various functions easier to use and set up its operation conditions.

Facilities for High-Efficiency Editing

Digital slow motion playback

Using the frame memory function, noiseless slow motion playback is possible at any speed in the range ±0.5 times* normal speed.

* The positive direction refers to forward movement of the tape, and the negative direction to reverse movement.

Digital jog sound function

When searching at speeds in the range ±0.5 times normal speed, the digital jog sound function is enabled. The audio signal is saved in temporary memory, and replayed according to the search speed. This allows searching on the sound track.

Remote control

The unit can be operated by remote control from an editing control unit that supports the RS-422A interface or an optional SIRCS*-compatible remote control unit such as the DSRM-10.

* SIRCS (Sony Integrated Remote Control System): A command protocol to remote control Sony professional videocassette recorders/players.

High-speed search function

The unit has a picture search function that allows you to view color picture at playback speeds up to 85 times normal speed in forward and reverse directions.
When remote-controlling this unit in shuttle mode from an editing control unit or a remote control unit, you can search at any speed in the range 0 (still) to 60 times normal speed in both directions. You can also search frame-by-frame in jog mode.
At search speeds up to 10 times normal speed in both directions, you can also hear playback audio.

Quick mechanical response

When you use the tape transport buttons of the unit, the tape inserted in the unit responds quickly.

Superimposition function

Time code values, operation mode indications, error messages, and other text data can be superimposed and output in analog composite video signals.

Easy Maintenance Functions

Self-diagnostic/alarm function: This function automatically detects setup and connection errors, operation faults, and other problems. It also displays a description of the problem, its cause, and the recommended response on the video monitor screen or time counter display.

Digital hours meter: The digital hours meter functions include four kinds of tally operations for operating hours, head drum usage hours, tape transport hours, and tape threading/unthreading times. The tally results can be viewed on the video monitor or the time counter display.

Other Features

AC operations

The unit operates with an AC power source in the range 100 to 240 V, 50/60 Hz.

Internal and external time codes

An internal time code generator and reader enables time code compliant with SMPTE (for DSR-1500)/EBU (DSR-1500P) format to be recorded and played back. This allows editing to single frame precision.
Outputting or inputting time code (LTC) to or from an external device is also possible using the TC IN/OUT connectors.
The unit is also compatible with VITC.

Internal test signal generator

The unit has built-in video and audio test signal generators. The video test signal generator can produce either a color bar signal or a black burst signal. The audio test signal generator can generate either a silent signal or a 1-kHz sine wave signal. Menu items are provided for selecting the test signals to be generated.

Support for ClipLink function

In response to commands sent from the EditStation, index pictures recorded on tape or ClipLink log data recorded in the cassette memory can be transferred to the EditStation.

The EditStation operator can then efficiently use these pictures and data in a preliminary editing session.

For an overview of the ClipLink function, see the appendix "ClipLink Guide" (page 105).

Video process control

For analog video output and SDI-format video output, you can use menu items to adjust the video output level, chroma signal output level, setup level (for DSR-1500), black level (for DSR-1500P), and chroma phase.

Reference signal connection

The reference video input connector of the unit is provided with a loop-through connector which can be used to connect the input reference video signal to other equipment. When there is no loop-through connection, the reference video input connector is automatically provided with a 75-ohm termination.

Closed caption compatibility

Whether or not to include closed captions in a recording can be determined with menu items (for DSR-1500 only).

Optional Accessories

DSBK-1501 Digital Input/Output Board

This interface enables digital video and audio signals in the SDI or SDTI (QSDI) format (either format to be selected with front panel buttons for input or with a menu item for output) and also AES/EBU-format digital audio signals to be transferred between this unit and digital Betacam VCRs or other digital equipment.

DSBK-1503 i.LINK/DV Input/Output Board

This interface allows you to connect the unit to other equipment provided with a Sony DV connector to carry out editing or dubbing of digital video and audio signals.

DSBK-1504/1504P Analog Input Board

When this interface is installed, the unit can input analog video and audio signals. The same BNC type input connectors are used to input analog video signals in different formats selected with front panel buttons.
The analog video signals that can be input are as follows.
• Composite video signals
• S-video signals
• Component video signals (Y, R–Y and B–Y)
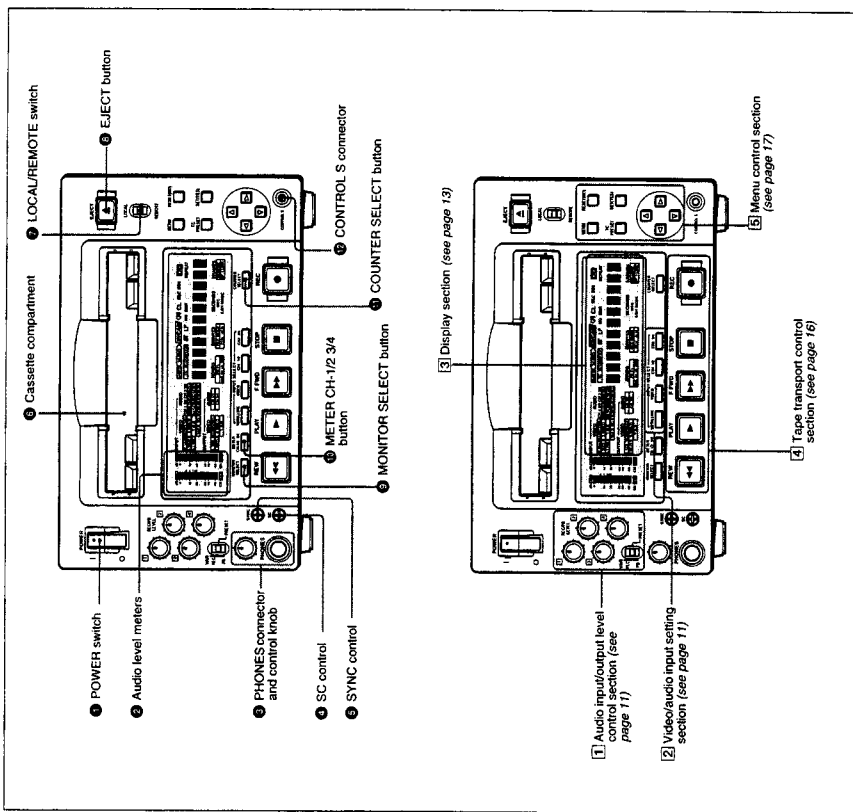
4 SC (subcarrier phase) control
Turn this control to accurately adjust the subcarrier phase of the composite video output signal of the unit with respect to the reference video signal. Use a cross-point (Phillips) screwdriver to turn it.

5 SYNC (synchronization phase) control
Turn this control to accurately adjust the synchronization phase of the output video signal of the unit with respect to the reference video signal. Use a cross-point (Phillips) screwdriver to turn it.

6 Cassette compartment
Accepts DVCAM, DV and DVCPRO (25 Mbps) videocassettes.

For details of usable cassettes, see page 23.

7 LOCAL/REMOTE switch
Selects whether the unit is operated from its front panel or from external equipment.
REMOTE: The unit is operated from external equipment connected to the REMOTE connector or DV IN/OUT connector (when the optional DSBK-1503 i.LINK/DV Input/Output Board is installed) on the rear panel.
LOCAL: The unit is operated from its front panel or from a SIRCS-compatible remote control unit connected to the CONTROL S connector on the front panel.

8 EJECT button
When you press this button, the cassette is automatically ejected after a few seconds.

1 POWER switch
Press the "I" side to power on the unit. This causes the audio level meters and the display section to light. To power off the unit, press the "O" side of the switch.

2 Audio level meters
These two meters indicate the recording audio levels during recording or EE mode* and the playback audio levels during playback. When the audio level indicated on a meter exceeds 0 dB, the OVER indicator for the meter lights.
The short bars to the right of level indication bars indicate that those levels are reference audio recording levels.
The settings made with the METER CH-1/2 3/4 button and MONITOR SELECT button select the audio channels for level indications on these meters as follows.

When CH-1/2 mode is selected with the METER CH-1/2 3/4 button:
Every time the MONITOR SELECT button is pressed, the audio channel selection for level indications on the two meters cycles through the following options.
• CH-1 (channel 1) only
    Only the left audio level meter lights.
• CH-2 (channel 2) only
    Only the right audio level meter lights.
• CH-1 and CH-2 (channels 1 and 2)
    Both the left and right audio level meters light.
When CH-3/4 mode is selected with the METER CH-1/2 3/4 button:
Every time the MONITOR SELECT button is pressed, the audio channel selection for level indications on the two meters cycles through the following options.
• CH-3 (channel 3) only
    Only the left audio level meter lights.
• CH-4 (channel 4) only
    Only the right audio level meter lights.
• CH-3 and CH-4 (channels 3 and 4)
    Both the left and right audio level meters light.

* E-E mode: Abbreviation of "Electric-to-Electric mode." In this mode, video and audio signals input to the VCR are output after passing through internal electric circuits, but not through magnetic conversion circuits such as heads and tapes. This can be used to check input signals and for adjusting input signal levels.

3 PHONES connector (stereo phone jack) and control knob
Connect stereo headphones to the connector for audio monitoring during recording or playback. The control knob controls the volume of the headphones. It also controls the level of the audio signal output from the MONITOR connector on the rear panel.
The settings made with the METER CH-1/2 3/4 button and MONITOR SELECT button select the audio channels for audio output via this connector. The same channel selection as for the audio level meters applies to this connector.

Location and Function of Parts

Front Panel

6 Cassette compartment
7 LOCAL/REMOTE switch
8 EJECT button

1 POWER switch
2 Audio level meters
3 PHONES connector and control knob
4 SC control
5 SYNC control

0 METER CH-1/2 3/4 button
9 MONITOR SELECT button
2 CONTROL S connector
1 COUNTER SELECT button

[1] Audio input/output level control section (see page 11)
[2] Video/audio input setting section (see page 11)
[3] Display section (see page 13)
[4] Tape transport control section (see page 16)
[5] Menu control section (see page 17)

2 Video/audio input setting section

1 SDTI/i.LINK (SDTI (QSDI) interface/i.LINK selection) button

Each press of this button cycles through the following input signal selection options.

- **Digital video signal in SDTI (QSDI) format input to the SDI/SDTI (QSDI) IN connector (optional DSBK-1501 board required)**
  When this is selected, use the CH1 1/2 button and CH2 3/4 button to select the required input audio signals.
- **Digital video and audio signals in SDTI (QSDI) format input to the SDI/SDTI (QSDI) IN connector (optional DSBK-1501 board required)**
- **Digital video and audio signals in i.LINK-compatible DV format input to the DV IN/OUT connector (optional DSBK-1503 board required)**

The selection made with this button is indicated in the INPUT signal display section (see page 14).

2 VIDEO button

Each press of this button cycles through the following input video signal selection options.

- Composite video signal input to the VIDEO IN connector (optional DSBK-1504/1504P board required)
- S-video (separated Y and C) signals input to the VIDEO IN connectors (optional DSBK-1504/1504P board required)
- Y, R–Y and B–Y component video signals input to the VIDEO IN connectors (optional DSBK-1504/1504P board required)
- SDI video signal input to the SDI/SDTI (QSDI) IN connector (optional DSBK-1501 board required)
- Video test signal (selected with the INT VIDEO SG menu item (see page 64) generated by the internal signal generator

The selection made with this button is indicated by the VIDEO indicators in the INPUT signal display section (see page 13).

1 Audio input/output level control section

REC/PB LEVEL control knobs

These knobs used to control audio levels function differently depending on the setting of the VAR switch as follows.

VAR switch setting	Functions of control knobs
PRESET	Control knobs are not effective. The analog audio input/output levels are set to the reference level set with the LEVEL SELECT menu item (see page 66).
REC	Control the analog/digital audio input levels on channels 1 to 4 during recording.
PB	Control the analog/digital audio output levels on channels 1 to 4 during playback.

VAR switch

Use to switch the way in which the REC/PB LEVEL control knobs function.

MONITOR SELECT button

Use this button and the METER CH-1/2 3/4 button to select the audio channels:

- for level indications on the audio level meters
- for audio output via the PHONES connector on the front panel
- for audio output via the MONITOR connector on the rear panel

Depending on the setting made with the METER CH-1/2 3/4 button, the channels for output to the above meters and connectors are selected as follows.

When CH-1/2 mode is selected with the METER CH-1/2 3/4 button:

Audio level meters	PHONES connector	MONITOR connector
CH-1 (channel 1) only. Only the left meter lights.	Channel 1 only (monaural)	Channel 1 only
CH-2 (channel 2) only. Only the right meter lights.	Channel 2 only (monaural)	Channel 2 only
CH-1 and CH-2 (channels 1 and 2). Both the left and right meters light.	Channels 1 and 2 (stereo)	Channels 1 and 2 (mixed)

When CH-3/4 mode is selected with the METER CH-1/2 3/4 button:

Audio level meters	PHONES connector	MONITOR connector
CH-3 (channel 3) only. Only the left meter lights.	Channel 3 only (monaural)	Channel 3 only
CH-4 (channel 4) only. Only the right meter lights.	Channel 4 only (monaural)	Channel 4 only
CH-3 and CH-4 (channels 3 and 4). Both the left and right meters light.	Channels 3 and 4 (stereo)	Channels 3 and 4 (mixed)

METER CH-1/2 3/4 button

Pressing this button toggles the audio level meter mode between CH-1/2 (channels 1 and 2) and CH-3/4 (channels 3 and 4).

The settings made with this button and the MONITOR SELECT button select the channels for level indications and audio output.

For more details, see "9 MONITOR SELECT button."

COUNTER SELECT button

Selects the type of time data to be shown in the time counter display. Each press of this button cycles through the following three indicator display options:

- COUNTER (CNT: count value of the time counter)
- TC (time code)
- U-BIT (user bits)
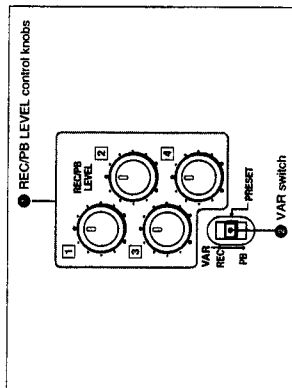
Note

If the LOCAL/REMOTE switch is set to REMOTE, the COUNTER SELECT button does not operate while the tape is moving. In this case, make the time data selection via the external equipment connected to the REMOTE connector on the rear panel.

CONTROL S connector (stereo minijack)

Connect a SIRCS-compatible remote control unit such as the DSRM-10 to this connector.

● CH1 1/2 (audio channel 1 or 1/2) button
Each press of this button cycles through the following input audio signal selection options for audio channel 1 (when in 2-channel mode) or for audio channels 1 and 2 (when in 4-channel mode).
• Analog audio signal input to the AUDIO IN 1/3 connector (optional DSBK-1504/1504P board required)
• Digital audio signal in AES/EBU format input to the AUDIO (AES/EBU) IN 1/2 connector (optional DSBK-1501 board required)
• SDI audio signal input to the SDI/SDTI (QSDI) IN connector (optional DSBK-1501 board required)
• Audio test signal (selected with the INT AUDIO SG menu item (see page 66) generated by the internal signal generator
The selection made with this button is indicated by the AUDIO CH-1 1/2 indicators in the INPUT signal display section (see page 13).
When analog audio is selected (optional DSBK-1504/1504P board required), the signal input to the AUDIO IN 1/3 connector is recorded either on channel 1 (when in 2-channel mode) or on channels 1 and 3 (when in 4-channel mode). That is, in 4-channel mode, the same analog audio signal is recorded on channels 1 and 3. Using the REC/PB LEVEL control knobs with the VAR switch set to REC, it is possible to adjust the audio levels on the two channels separately.
You can switch the audio recording mode with the REC MODE menu item (see page 65). The selection is indicated by the REC MODE display on the front panel.

● CH2 3/4 (audio channel 2 or 3/4) button
Each press of this button cycles through the following input audio signal selection options for audio channel 2 (when in 2-channel mode) or for audio channels 3 and 4 (when in 4-channel mode).
• Analog audio signal input to the AUDIO IN 2/4 connector (optional DSBK-1504/1504P board required)
• Digital audio signal in AES/EBU format input to the AUDIO (AES/EBU) IN 3/4 connector (optional DSBK-1501 board required)
• SDI audio signal input to the SDI/SDTI (QSDI) IN connector (optional DSBK-1501 board required)
• Audio test signal (selected with the INT AUDIO SG menu item (see page 66) generated by the internal signal generator
The selection made with this button is indicated by the AUDIO CH-2 3/4 indicators in the INPUT signal display section (see page 13).
When analog audio is selected (optional DSBK-1504/1504P board required), the signal input to the AUDIO IN 2/4 connector is recorded either on channel 2 (when in 2-channel mode) or on channels 2 and 4 (when in 4-channel mode). That is, in 4-channel mode, the same analog audio signal is recorded on channels 2 and 4. Using the REC/PB LEVEL control knobs with the VAR switch set to REC, it is possible to adjust the audio levels on the two channels separately.
You can switch the audio recording mode with the REC MODE menu item (see page 65). The selection is indicated by the REC MODE display on the front panel.

3 Display section

Time data type indicators
SERVO indicator
Playback tape format indicators
Cassette memory indicator
Time counter display
OUTPUT signal display section
INPUT signal display section
NO EDIT indicator
CL indicator
REC INHI indicator
Tape end alarm indicator
REPEAT indicator
Remote mode indicators
VITC indicator
EDIT MODE indicator
REC MODE display
PB Fs display
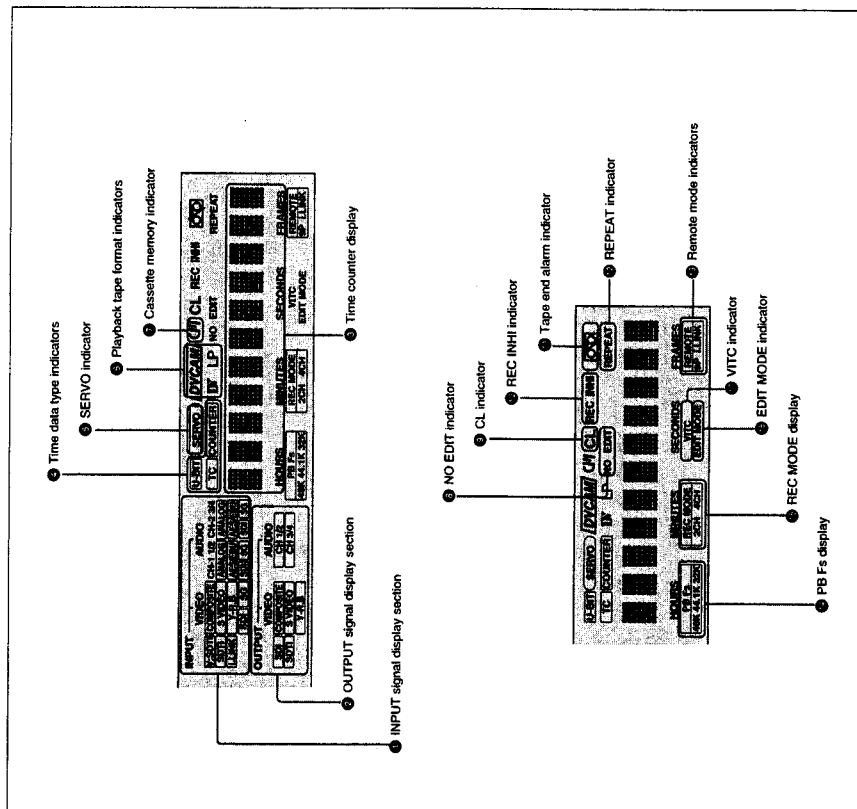
● INPUT signal display section
Indicates the input video and audio signal formats selected with the INPUT SELECT buttons (SDTI/i.LINK, VIDEO, CH1 1/2, and CH2 3/4 buttons).

Note
The indicators without the corresponding optional boards installed in the unit do not light.

V:SDTI indicator: Lights when the digital video signal only in SDTI (QSDI) format is selected (optional DSBK-1501 board required).
SDTI indicator: Lights when the digital video and audio signals in SDTI (QSDI) format are selected (optional DSBK-1501 board required).
i.LINK indicator: Lights when the digital video and audio signals in i.LINK-compatible DV format are selected (optional DSBK-1503 board required).

VIDEO indicators: The indicator (COMPOSITE, S VIDEO, Y–R,B, SDI, or SG) corresponding to the selected input video signal format lights.

Indicators	Meanings
COMPOSITE	Composite video signal (optional DSBK-1504/1504P board required)
S VIDEO	S-video (separated Y and C) signals (optional DSBK-1504/1504P board required)
Y–R,B	Y, R–Y and B–Y component video signals (optional DSBK-1504/1504P board required)
SDI	SDI video signal (optional DSBK-1501 board required)
SG	Video test signal (factory default setting)

AUDIO indicators: Comprise the CH-1 1/2 indicator and CH-2 3/4 indicator, under each of which there are four more indicators (ANALOG, AES/EBU, SDI, and SG). They indicate the selected input audio signal formats.

Indicators	Functions
CH-1 1/2 (ANALOG, AES/EBU, SDI, SG)	The indicator corresponding to the signal format selected for audio input to channel 1 (when in 2-channel mode) or to channels 1 and 2 (when in 4-channel mode) lights. ANALOG: Analog audio signal (optional DSBK-1504/1504P board required) AES/EBU: Digital audio signal in AES/EBU format (optional DSBK-1501 board required) SDI: SDI audio signal (optional DSBK-1501 board required) SG: Audio test signal (factory default setting)
CH-2 3/4 (ANALOG, AES/EBU, SDI, SG)	The indicator corresponding to the signal format selected for audio input to channel 2 (when in 2-channel mode) or to channels 3 and 4 (when in 4-channel mode) lights. ANALOG: Analog audio signal (optional DSBK-1504/1504P board required) AES/EBU: Digital audio signal in AES/EBU format (optional DSBK-1501 board required) SDI: SDI audio signal (optional DSBK-1501 board required) SG: Audio test signal (factory default setting)

② OUTPUT signal display section

Indicates the output video and audio signal format selected with the INTERFACE SELECT menu items (see page 67).

Note
The indicators without the corresponding optional boards installed in the unit do not light.

SDI indicator: Lights when the digital video and audio signals in SDI format are selected (optional DSBK-1501 board required).
The SDI video and audio signals are output to the SDI/SDTI (QSDI) OUT1 and OUT2 connectors.

SDTI indicator: Lights when the digital video and audio signals in SDTI (QSDI) format are selected (optional DSBK-1501 board required).
The video and audio signals in SDTI (QSDI) format are output to the SDI/SDTI (QSDI) OUT1 and OUT2 connectors.

VIDEO indicators: The indicator (COMPOSITE, S VIDEO, or Y–R,B) corresponding to the selected output analog video signal format lights.

Indicators	Meanings
COMPOSITE	Composite video signal
S VIDEO	S-video (separated Y and C) signals
Y–R,B	Y, R–Y and B–Y component video signals

This selection determines the signals output from the Y/CPST, R–Y/C/CPST, and B–Y/CPST (SUPER) connectors as follows.

• When COMPOSITE is selected:

Connectors	Output signals
Y/CPST	Composite signal
R–Y/C/CPST	Composite signal
B–Y/CPST (SUPER)	Composite signal

• When S VIDEO is selected:

Connectors	Output signals
Y/CPST	Y signal
R–Y/C/CPST	C signal (3.58 MHz for DSR-1500/ 4.43 MHz for DSR-1500P)
B–Y/CPST (SUPER)	Composite signal

• When Y–R,B is selected:

Connectors	Output signals
Y/CPST	Y signal
R–Y/C/CPST	R–Y signal
B–Y/CPST (SUPER)	B–Y signal

AUDIO indicators: Comprise the CH 1/2 indicator and CH 3/4 indicator to indicate the channel selection for analog audio output from the AUDIO OUT 1/3 and AUDIO OUT 2/4 connectors.

Indicators	Functions
CH 1/2	Lights when channels 1 and 2 are selected for analog audio output from the AUDIO OUT 1/3 and AUDIO OUT 2/4 connectors.
CH 3/4	Lights when channels 3 and 4 are selected for analog audio output from the AUDIO OUT 1/3 and AUDIO OUT 2/4 connectors.

You can change the channel selection with the AUDIO OUTPUT menu item (see page 67).

③ Time counter display
Indicates the count value of the time counter, time code, VITC, or user bit data depending on the settings of the COUNTER SELECT button and the TC SELECT menu item (see page 62).
Also used to display error messages, edit data, setup menu data, etc.

④ Time data type indicators
One of the three indicators (COUNTER, U-BIT, or TC) lights to indicate the type of time data currently shown in the time counter display.
COUNTER: Count value of the time counter
U-BIT: User bit data
TC: SMPTE time code (for DSR-1500) or EBU time code (for DSR-1500P)

⑤ SERVO (servolock) indicator
Lights when the drum servo and capstan servo are locked.*

* Servolock: Synchronizing the drum rotation phase and tape transport phase with a reference signal during playback and recording, so that the video heads scan the tape in the same pattern during playback and recording.

⑥ Playback tape format indicators
DVCAM: This lights when a tape recorded in DVCAM format is played back.
DV: This lights when a tape recorded in consumer DV format is played back.
LP: This flashes along with "DV" when a tape recorded in LP mode is played back.
Video recorded in LP mode cannot be played back correctly and audio is muted.
When a tape recorded in DVCPRO (25 Mbps) format or any other format than those mentioned above is played back, none of the above indicators lights.

⑦ Cassette memory indicator
Lights when a cassette provided with a memory chip ("cassette memory") is loaded.

⑧ NO EDIT (not editable) indicator
Lights during playback of a tape that contains a recording in other than the DVCAM format. When this indicator is lit, the recordings contained in the tape can be used as source material for editing, but editing operations such as insert editing and assemble editing cannot be performed.
This indicator also lights when the audio recording mode selected on this unit does not coincide with that of the loaded tape during editing operation.

⑨ CL (ClipLink) indicator
Lights when a cassette is loaded on which ClipLink log data is stored in the cassette memory.

For details of ClipLink log data, see the appendix "ClipLink Guide" (page 105).

⑩ REC INHI (recording inhibit) indicator
Lights when the REC/SAVE switch on the loaded cassette is in the SAVE position (recording inhibited).

⑪ Tape end alarm indicator
Starts flashing when the remaining capacity of the tape is for about 2 minutes.

⑫ REPEAT (repeat playback) indicator
Lights when the REPEAT MODE menu item (see page 58) is set to ON to enable the repeat playback function.

⑬ Remote mode indicators
REMOTE: Lights when the LOCAL/REMOTE switch is set to REMOTE to remote control the unit from either an editing control unit connected to the REMOTE connector or equipment connected to the DV IN/OUT connector (when the optional DSBK-1503 board is installed).
9P: Lights when the REMOTE I/F menu item (see page 67) is set to 9PIN.
i.LINK: Lights when the REMOTE I/F menu item (see page 67) is set to i.LINK (optional DSBK-1503 board required).

⑭ PB Fs (playback audio sampling frequency) display
During playback, this indicates the playback audio mode in which the tape being played back was recorded.
48K indicator: Lights during playback of a tape recorded in 2-channel mode (48 kHz).
44.1K indicator: Lights during playback of a tape recorded in 2-channel mode (44.1 kHz).
32K indicator: Lights during playback of a tape recorded in 4-channel mode (32 kHz).

⑤ △▽◁▷ (arrow) buttons

Use these buttons to move around the menu items, and also to modify the initial time code value and user bit data.

When the SEARCH ENABLE menu item (see page 59) is set to ENABLE, you can also use these buttons to carry out the following playback operations.

Playback type	Direction	Operation to carry out
High-speed playback in shuttle mode	Forward	Press the ▷ button.
	Reverse	Press the ◁ button.
Frame-by-frame playback	Forward	Press the △ button.
	Reverse	Press the ▽ button.
Continuous playback in jog mode	Forward	Hold down the △ button.
	Reverse	Hold down the ▽ button.

For details on modifying the time code value, see "To set the initial time code value and user bit data" on page 45.

5 Menu control section

- **① MENU button**
- **② RESET (NO) button**
- **③ TC PRESET button**
- **④ SET (YES) button**
- **⑤ △▽◁▷ buttons**

① MENU button

Press this button to display the menu on the monitor screen and the time counter display. Press it again to exit the menu display.

On how to use the menu, see Chapter 4 "Menu Settings."

② RESET (NO) button

Press this button to:
- reset menu settings,
- reset the time data shown in the time counter display to zero, or
- send a negative response to the prompts issued by the unit.

③ TC (time code) PRESET button

Use this button to set the initial value of the time code produced by the internal time code generator and user bit data.

For details on setting an initial time code value and user bit data, see "To set the initial time code value and user bit data" on page 45.

④ SET (YES) button

Press this button to:
- save new settings, such as selected menu items and time code settings, to memory, or
- send a positive response to the prompts issued by the unit.

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⑩ REC MODE (audio recording mode) display

This indicates the audio recording mode currently selected with the REC MODE menu item (see page 65).

2CH indicator: Lights in 2-channel mode (48 kHz).

4CH indicator: Lights in 4-channel mode (32 kHz).

⑪ EDIT MODE indicator

Lights when this unit is selected as the recorder VCR under the control of either an editing control unit connected to the REMOTE connector or equipment connected to the DV IN/OUT connector (when the optional DSBK-1503 board is installed).

⑫ VITC indicator

Lights when VITC is being read or recorded regardless of the data shown in the time counter display.

4 Tape transport control section

- **① REW button**
- **② PLAY button**
- **③ F FWD button**
- **④ STOP button**
- **⑤ REC button**

① REW (rewind) button

When you press this button, it lights and the tape starts rewinding.

When the F. FWD/REW menu item (see page 59) is set to PB, the picture appears on the monitor during rewind (maximum 85 times normal speed).

② PLAY button

When you press this button, it lights and playback begins.

If you press this button during recording or editing, the recording or editing operation is stopped and this unit enters playback mode.

③ F FWD (fast forward) button

When you press this button, it lights and the tape is fast forwarded.

When the F. FWD/REW menu item (see page 59) is set to PB, the picture appears on the monitor during fast forward (maximum 85 times normal speed).

④ STOP button

Press this button to stop the current tape transport operation.

⑤ REC (record) button

When you press this button while holding down the PLAY button, it lights and recording begins.

Note

When the LOCAL/REMOTE switch is set to REMOTE (the REMOTE indicator is lit), no tape transport control buttons other than the EJECT and STOP buttons will work. This can be changed with the LOCAL ENABLE menu item (see page 59).

Rear Panel

- AC IN connector
- REMOTE connector
- REF. (reference) VIDEO IN connectors
- 1 Analog video/audio signal input section (see page 19)
- 2 Analog video/audio signal output section (see page 20)
- DV IN/OUT connector
- 3 Digital signal input/output section (see page 21)
- 4 Time code input/output section (see page 21)

AC IN connector
Use the supplied power cord to connect this to an AC outlet.

DV IN/OUT connector (6-pin IEEE-1394) (optional DSBK-1503 i.LINK/DV Input/Output Board)
This connector is available when the optional DSBK-1503 board is installed. It inputs and outputs digital video and audio signals in DV format.

Note
When searching at speeds in the range $+^1/_2$ to $+^1/_{30}$ or $-^1/_{30}$ to $-^1/_2$ times normal speed, the audio signal output from this connector and monitored on external equipment may sound differently from the audio signal played back on this unit.

REMOTE connector (D-sub 9-pin)
When controlling this unit from an editing control unit such as the ES-7, PVE-500, BVE-600/800/910, or RM-450/450CE, connect the editing control unit to this connector using the optional 9-pin remote control cable.

REF. (reference) VIDEO IN connectors (BNC type)
Input a reference video signal. The two connectors are loop-through connectors. You can connect the reference video signal input to the left connector to other equipment via the right connector (marked ⊶). When no connection is made to the right connector, the left connector is terminated with an impedance of 75 Ω automatically.

1 Analog video/audio signal input section (optional DSBK-1504/1504P Analog Input Board)

The connectors in this section are available when the optional DSBK-1504/1504P board is installed.

- VIDEO IN connectors
- AUDIO IN 1/3 and AUDIO IN 2/4 connectors
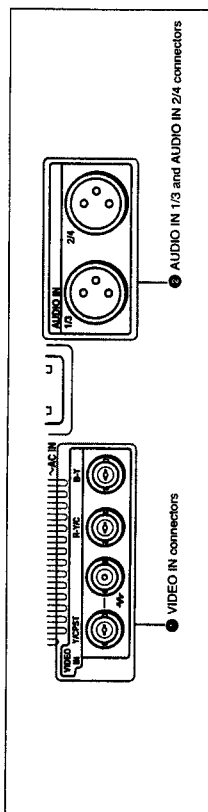
VIDEO IN connectors (BNC type)
There are the following VIDEO IN connectors for inputting analog video signals:
- Y/CPST (loop-through connectors)
- R-Y/C
- B-Y

The signals you can connect to these connectors depend on the selection made with the VIDEO button in the video/audio input selection section. The selection is indicated by the VIDEO indicators in the INPUT signal display section. The analog video signals that can be input to these connectors are as follows.

When COMPOSITE is selected:

Connectors	Input signals
Y/CPST	Composite signal
R-Y/C	— (not usable)
B-Y	— (not usable)

The two Y/CPST connectors are loop-through connectors. When using the signal input to the left Y/CPST connector as a reference video signal, for example, you can bridge-connect the signal to other equipment via the right Y/CPST connector (marked ⊶). When no connection is made to the right Y/CPST connector, the left Y/CPST connector is terminated with an impedance of 75 Ω automatically.

When S VIDEO is selected:

Connectors	Input signals
Y/CPST	Y signal
R-Y/C	C signal (3.58 MHz for DSR-1500/ 4.43 MHz for DSR-1500P)
B-Y	— (not usable)

When Y-R,B is selected:

Connectors	Input signals
Y/CPST	Y signal
R-Y/C	R-Y signal
B-Y	B-Y signal

AUDIO IN 1/3 and AUDIO IN 2/4 connectors (XLR-3 pin, female)
Use these connectors to input analog audio signals from an external video cassette player or other audio equipment. The signals input to these connectors are recorded on the audio channels determined by the current audio recording mode, as follows.

When in 2 CH (48 kHz) mode:

Input connectors	Audio channels on which input signals are recorded
AUDIO IN 1/3	Audio channel 1
AUDIO IN 2/4	Audio channel 2

When in 4 CH (32 kHz) mode:

Input connectors	Audio channels on which input signals are recorded
AUDIO IN 1/3	Audio channels 1 and 3
AUDIO IN 2/4	Audio channels 2 and 4

You can switch the audio recording mode with the REC MODE menu item (see page 65). The selection is indicated by the REC MODE display on the front panel.

2 Analog video/audio signal output section

● VIDEO OUT connectors
● AUDIO OUT 1/3 and AUDIO OUT 2/4 connectors
● MONITOR connector
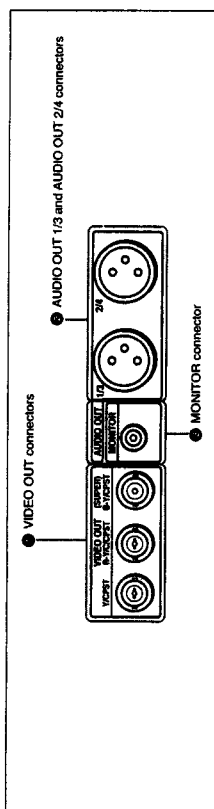
● VIDEO OUT connectors (BNC type)

There are the following VIDEO OUT connectors for outputting analog video signals:

- Y/CPST
- R–Y/CPST
- B–Y/CPST (SUPER)

The signals output from these connectors depend on the setting of the VIDEO OUTPUT menu item (see page 67). The setting is indicated by the VIDEO indicators in the OUTPUT signal display section on the front panel.

The analog video signals that can be output from these connectors are as follows.

When COMPOSITE is selected:

Connectors	Output signals
Y/CPST	Composite signal
R–Y/CPST	Composite signal
B–Y/CPST (SUPER)	Composite signal

When the CHARA. DISPLAY menu item (see page 60) is set to ON (factory default setting), the B–Y/CPST (SUPER) connector outputs a composite video signal with superimposed text information.

When S-VIDEO is selected:

Connectors	Output signals
Y/CPST	Y signal
R–Y/CPST	C signal (3.58 MHz for DSR-1500/ 4.43 MHz for DSR-1500P)
B–Y/CPST (SUPER)	Composite signal

When the CHARA. DISPLAY menu item (see page 60) is set to ON (factory default setting), the B–Y/CPST (SUPER) connector outputs a composite video signal with superimposed text information.

When Y–R, B is selected:

Connectors	Output signals
Y/CPST	Y signal
R–Y/CPST	R–Y signal
B–Y/CPST (SUPER)	B–Y signal

● AUDIO OUT 1/3 and AUDIO OUT 2/4 connectors (XLR-3 pin, male)

These connectors output analog audio signals. The output audio channels are determined by the playback audio mode and the setting (1/2 CH or 3/4 CH) of the AUDIO OUTPUT menu item (see page 67) as follows.

When in 2 CH (48 kHz or 44.1 kHz) mode:

Output connectors	Output audio channels
AUDIO OUT 1/3	Audio channel 1 (when 1/2 CH is selected) or silent (when 3/4 CH is selected)
AUDIO OUT 2/4	Audio channel 2 (when 1/2 CH is selected) or silent (when 3/4 CH is selected)

When in 4 CH (32 kHz) mode:

Output connectors	Output audio channels
AUDIO OUT 1/3	Audio channel 1 (when 1/2 CH is selected) or audio channel 3 (when 3/4 CH is selected)
AUDIO OUT 2/4	Audio channel 2 (when 1/2 CH is selected) or audio channel 4 (when 3/4 CH is selected)

The current playback audio mode is indicated by the PB Fs display on the front panel.

● MONITOR connector (RCA phono jack)

This connector outputs audio signals for monitoring. The audio signals to be output from this connector can be selected with the MONITOR SELECT button and METER CH-1/2 3/4 button on the front panel.

3 Digital signal input/output section (optional DSBK-1501 Digital Input/Output Board)

The connectors in this section are available when the optional DSBK-1501 board is installed.

● SDI/SDTI (QSDI) IN connector
● SDI/SDTI (QSDI) OUT1/OUT2 connectors
● AUDIO (AES/EBU) IN 1/2 and AUDIO (AES/EBU) IN 3/4 connectors
● AUDIO (AES/EBU) OUT 1/2 and AUDIO (AES/EBU) OUT 3/4 connectors
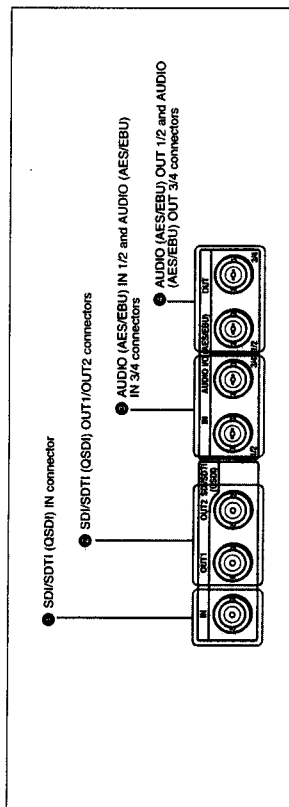
● SDI/SDTI (QSDI) IN (Serial Digital Interface/ Serial Data Transport Interface (QSDI) input) connector (BNC type)

This connector inputs digital video and audio signals in SDTI (QSDI) or SDI format. To select the required input signal formats, use the SDTI/i.LINK button or VIDEO button on the front panel. The current input signal selections are indicated in the INPUT signal display section on the front panel.

● SDI/SDTI (QSDI) OUT1/OUT2 (Serial Digital Interface/Serial Data Transport Interface (QSDI) output 1/output 2) connectors (BNC type)

These connectors output digital video and audio signals in SDTI (QSDI) or SDI format. To select these output signal formats, use the DIGITAL OUTPUT menu item (see page 67). The current output signal selections are indicated in the OUTPUT signal display section on the front panel.

● AUDIO (AES/EBU) IN 1/2 and AUDIO (AES/ EBU) IN 3/4 connectors (BNC type)

Input digital audio signals in AES/EBU format to these connectors.
The left connector (1/2) is for audio channels 1 and 2, and the right connector (3/4) is for audio channels 3 and 4.

● AUDIO (AES/EBU) OUT 1/2 and AUDIO (AES/ EBU) OUT 3/4 connectors (BNC type)

These connectors output digital audio signals in AES/EBU format.
The left connector (1/2) is for audio channels 1 and 2, and the right connector (3/4) is for audio channels 3 and 4.

4 Time code input/output section

● TC IN connector
● TC OUT connector
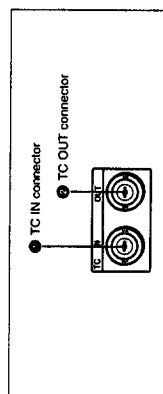
● TC IN (time code input) connector (BNC type)

Input externally generated SMPTE time code (for DSR-1500) or EBU time code (for DSR-1500P) to this connector.

● TC OUT (time code output) connector (BNC type)

This connector outputs a time code according to the operating state of the unit, as follows:

During playback: the playback time code
During recording: the time code generated by the internal time code generator or the time code input to the TC IN connector. When the EE OUT PHASE menu item (see page 63) is set to MUTE, no time code is output.

Note

When searching at speeds in the range $+1/2$ to $+1/30$ or $-1/2$ to $-1/30$ times normal speed, the audio signal output from these connectors in SDTI (QSDI) format and monitored on external equipment may sound differently from the audio signal played back on this unit.

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Usable Cassettes

This unit can use the DVCAM cassettes listed below.

Model name	Size
PDV-64ME/94ME/124ME/184ME	Standard size
PDVM-12ME/22ME/32ME/40ME	Mini size

The numbers in each model name indicate the maximum recording/playback time (in minutes) for each model. For example, the PDV-184ME has a maximum recording/playback time of 184 minutes.

Cassettes usable for playback only
All consumer DV cassettes and large- and medium-size DVCPRO (25 Mbps) cassettes are usable for playback only.

Notes
• If you insert an incorrect type of cassette, it will be automatically ejected.
• When operating this unit as a player, you can also use DV cassettes on the unit. However, it is the best choice to always use DVCAM cassettes because they are more reliable than DV cassettes whatever your purpose may be: playback, editing, or long-period storage of recordings.
• Cassettes that have been recorded by a DV-format recorder can be played back on this unit but cannot be used for recording at editing operation. When you insert such a cassette into this unit, the NO EDIT indicator lights up in the display section on the front panel of this unit.

Preventing accidental erasure

Set the REC/SAVE switch on the cassette to SAVE to prevent accidental erasure of recorded contents.

REC/SAVE switch

Set to SAVE

To enable re-recording
Set the REC/SAVE switch to REC.
When this switch is set to SAVE, the unit cannot record on the tape.

Inserting and Ejecting Cassettes

Inserting a cassette

This unit accepts three sizes of cassette: L (standard size), M (medium size: DVCPRO) and S (mini size). When inserting a cassette in the unit, make sure its tape window faces upward as shown in the following figure.

Mini size (Insert the cassette into the middle of the cassette compartment.)

Standard size

Outer guides

Tape window facing upward

Inner guides

Medium size (Align the cassette with the outer guides, then slide it in over the inner guides.)

Tape window facing upward

DVCAM cassettes

The following figure illustrates the DVCAM cassettes.

REC/SAVE switch
For details of this switch, see "Preventing accidental erasure" on page 25.

Mini size

Standard size

Cassette memory
This memory is used to store ClipLink log data.
For details of ClipLink log data, see the appendix "ClipLink Guide" (page 105).
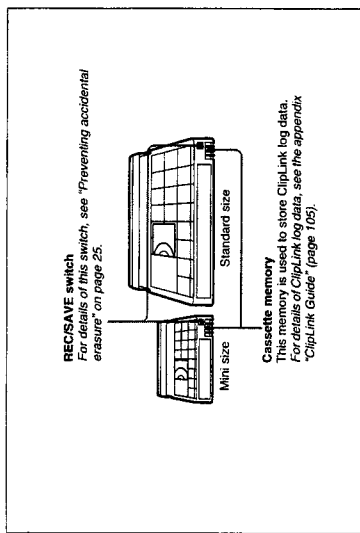
Notes on using cassettes

- Before storing the cassette for a long period of time, rewind the tape to the beginning and be sure to put the cassette in its storage case, preferably on end instead of flat on its side.
  Storing a cassette in any other condition (not rewound, out of its case, etc.) may cause the video and audio contents to become damaged over time.
- If the cassette memory connector (contact point) becomes dirty, connection problems may occur, causing a loss of functions. Remove away any dust or dirt from this area before using the cassette.
- If the cassette is dropped on the floor or otherwise receives a hard impact, the tape may become slackened and may not record and/or play back correctly.

For information about how to check the tape for slack, see the next section.

Checking the tape for slack

Using a paper clip or a similar object, turn the reel gently in the direction shown by the arrow. If the reel does not move, there is no slack. Insert the cassette into the cassette compartment, and after about 10 seconds take it out.

Reel

Paper clip, etc.

No double insertion of cassettes

When you insert a cassette, the orange lock-out plate appears in the cassette compartment to prevent double insertion.

Ejecting a cassette

Press the EJECT button.

EJECT button

1-14
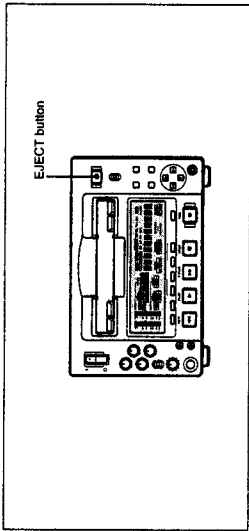
Recording

This section describes the necessary settings and operations to perform recording on this unit. The same settings and operations apply whether you are using the unit as part of an editing system, for dubbing, or as a stand-alone recorder.

For the necessary connections for recording and the settings not covered in this section, see Chapter 5 "Connections and Settings."

For dubbing of SDTI (QSDI) format signals, use the AUTO FUNCTION menu item SDTI DUBBING (see page 71). For details, see "Digitally Dubbing Signals in DVCAM Format" on page 51.

Note
When using the unit as a recorder, the optional boards corresponding to the input signal formats to be used are required.

For details about the optional boards, see "Optional Accessories" (page 7).

Settings for Recording
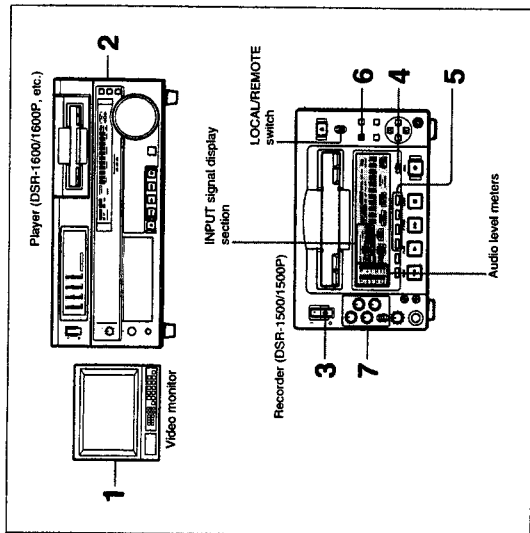
Player (DSR-1600/1600P, etc.)

Video monitor

INPUT signal display section

LOCAL/REMOTE switch

Recorder (DSR-1500/1500P)

Audio level meters

When controlling this unit from an editing control unit connected to the REMOTE connector, see "LOCAL/REMOTE switch" on page 9 and the description of the REMOTE I/F menu item on page 67.

DSR-1500/1500P

1 Power on the video monitor, then set its input switches according to the signals input from this unit.

2 Set up the player to play back a tape.

For details, refer to the operating instructions for the player.

3 Power on this unit by pressing on the | side of the POWER switch.

4 When the REMOTE indicator is off (the external editing control unit is not used), use the COUNTER SELECT button to select the type of time data to be used.

Each press of this button cycles through three options: COUNTER (CNT value), TC (time code), and U-BIT (user bit data). The time data type indicator for each option lights as it is selected.

Selected time data	Time data type indicator
Count value of the time counter	COUNTER
Time code	TC
User bit data	U-BIT

When the REMOTE indicator is lit, selection of the time data type is carried out at the editing control unit.

5 Select the formats of video and audio input signal to be recorded.

Use the INPUT SELECT buttons in the video/audio input setting section to select the desired signal formats. Each selection is shown by a lit indicator in the INPUT signal display section.

Video input signal (input connector)	Corresponding INPUT SELECT button	Lit indicator in the INPUT signal display section a)
Composite signal (VIDEO IN: Y/CPST)	VIDEO	COMPOSITE in VIDEO group
Separated Y/C signal (VIDEO IN: Y/CPST and R-Y/C)	VIDEO	S VIDEO in VIDEO group
Component signal (VIDEO IN: Y/CPST, R-Y/C, and B-Y)	VIDEO	Y-R,B in VIDEO group
SDI signal (SDI/SDTI (QSDI) IN)	VIDEO	SDI in VIDEO group
SDTI (QSDI) signal (SDI/SDTI (QSDI) IN)	SDTI/i.LINK	SDTI: both SDTI video and audio input signals are recorded. V-SDTI: only SDTI video input signal is recorded.
i.LINK-compatible digital video signal in DV format (DV IN/OUT)	SDTI/i.LINK	i.LINK
Internal test video signal	VIDEO	SG in VIDEO group

a) The indicators without the corresponding optional boards (DSBK-1501/1503/1504/1504P) installed in the unit do not light.

Audio input signal (input connector)	Corresponding INPUT SELECT button	Lit indicator in the INPUT signal display section a)
Analog signal (AUDIO IN 1/3 and AUDIO IN 2/4)	CH1 1/2 and CH2 3/4	ANALOG in AUDIO group
AES/EBU signal (AUDIO (AES/EBU) IN)	CH1 1/2 and CH2 3/4	AES/EBU in AUDIO group
SDI signal (SDI/SDTI (QSDI) IN)	CH1 1/2 and CH2 3/4	SDI in AUDIO group
SDTI (QSDI) signal (SDI/SDTI (QSDI) IN)	SDTI/i.LINK	SDTI
i.LINK-compatible digital audio signal in DV format (DV IN/OUT)	SDTI/i.LINK	i.LINK
Internal test audio signal	CH1 1/2 and CH2 3/4	SG in AUDIO group

a) The indicators without the corresponding optional boards (DSBK-1501/1503/1504/1504P) installed in the unit do not light.

Caution

Once you have started recording, you cannot change the input signal selection.

6 Select the audio mode.

Select either two-channel mode (2 CHANNEL) or four-channel mode (4 CHANNEL) with the REC MODE menu item (*see page 65*). The corresponding indicator lights in the REC MODE display.

Audio mode	Lit indicator in the REC MODE display
2-channel mode	2CH
4-channel mode	4CH

Cautions

- In the DVCAM format, there are two audio recording modes, with either two channels at 48 kHz or four channels at 32 kHz. It is not possible to select other modes (for example with four channels at 48 kHz).
- During audio editing, if a signal used in assemble or insert editing is in a different mode from the base tape, the signals will be discontinuous at the edit points, and correct editing will not be obtained. For this reason, audio editing between different modes is inhibited on this unit.
  For smooth editing operations, check the audio recording mode of the base tape beforehand.
- Once you have started recording, you cannot change the audio mode selection.
- If on a tape there is a point where the audio mode is switched, it is not possible to carry out insert editing over a section including that point.
- When, in 4-channel mode, analog audio is selected for all four channels (channels 1/2 and 3/4), the same analog audio signals are recorded on channels 1 and 3 and on channels 2 and 4, respectively.

1 After checking the following items, hold the cassette with the tape window facing upward, then insert it into the recorder (this unit) as illustrated on page 25.

Item to check	See section
Make sure that the REC/SAVE switch of the cassette is set to REC.	"Preventing accidental erasure" on page 25
Check for tape slack.	"Checking the tape for slack" on page 24
Make sure that the "HUMID!" alarm is not shown in the time counter display.	"Condensation" on page 93

The cassette is automatically drawn into the unit and the tape is wound round the head drum. The tape is stationary while the head drum rotates, and the STOP button lights.

If the REC INHI indicator lights:
It indicates that the REC/SAVE switch of the loaded cassette has been set to SAVE. Press the EJECT button in the tape transport control section to remove the cassette, then set the REC/SAVE switch to REC and reload the cassette.

Note
When ejecting and loading cassettes, make sure that the unit has been powered on.

2 Hold down the REC button and press the PLAY button.
This puts the unit into recording mode, and the tape starts moving.

3 Press the PLAY button on the player.
The player starts the playback operation, at which point this unit starts recording the input playback signals.

Cautions
• Once you have started recording, you cannot change the audio mode selection.
• If on a tape there is a point where the audio mode is switched, it is not possible to carry out insert editing over a section including that point.

---

7 With the VAR switch on the front panel set to REC, use the REC/PB LEVEL control knobs to adjust audio input levels. Watching the audio level meter, adjust the level so that the meter does not indicate higher values than 0 dB when the audio signal is at its maximum. When the level exceeds 0 dB, the OVER indicator lights.

The factory-preset audio recording level is –20 dB (DSR-1500) or –18 dB (DSR-1500P). This setting can be changed using the LEVEL SELECT menu item (see page 66).

Recording Procedure

This section describes the procedure to perform recording on this unit, showing an example session in which playback signals coming from a player VCR will be recorded on the tape loaded in the unit.

LOCAL/REMOTE switch

Recorder (DSR-1500/1500P)

Player (DSR-1600/1600P, etc.)
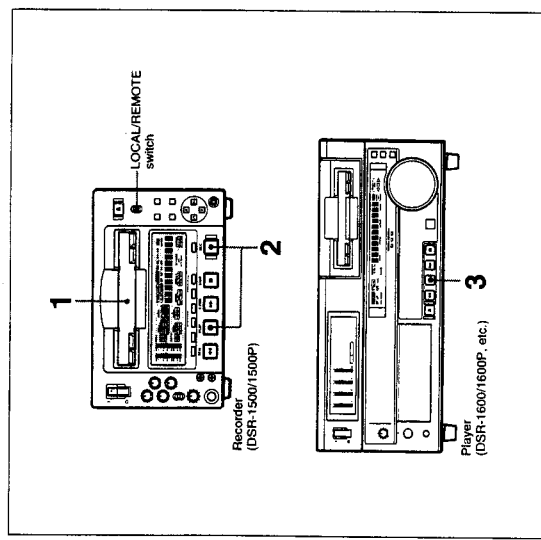
Notes
• When controlling this unit from an editing control unit connected to the REMOTE connector of this unit, set the LOCAL/REMOTE switch to REMOTE, turning the REMOTE indicator on. When not, set the switch to LOCAL, turning the indicator off.
• If you intend to use a tape recorded on this unit in a system comprising a DSR-85/85P and an ES-7 EditStation, it is recommended to record color bars on at least the first 40 seconds of the tape.
When transferring digital signals from the DSR-85/85P to the ES-7 EditStation at four times normal speed, there must be recording for approximately 40 seconds before the IN point.

If the following indicators light when a cassette is loaded

Indicator	It means:
Cassette memory indicator	The loaded cassette contains a cassette memory.
CL indicator	There is ClipLink log data stored in the cassette memory on the loaded cassette. **Caution** With such a cassette, carrying out recording destroys the ClipLink log data.
NO EDIT indicator	The recording format of the tape is "DV," or a DVCPRO tape is inserted. Replace the tape with one that has been recorded in DVCAM format. **During editing operation** The audio recording mode selected on this unit does not coincide with that of the tape. In this case, set the unit for the same audio recording mode as with the tape. However, if your current purpose is recording only, you can use the tape as it is. For more details, see "Troubleshooting" on page 96.

To perform the following operations

Operation	Do this:
Stop recording.	Press the STOP button. The unit enters stop mode, and will automatically switch to standby off mode after the time period set with the STOP TIMER menu item (see page 63) for tape protection.
Remove the cassette.	Press the EJECT button. After a few seconds, the tape is unwound from the head drum and the cassette is automatically ejected. If a CNT value is shown on the time counter display (the time data type indicator "COUNTER" is lit), the CNT value is reset.
Inhibit the unit from outputting text information (time data, operation mode indications, etc.) to the video monitor.	Set the CHARA. DISPLAY menu item (see page 60) to OFF.
Change the time period before the unit switches from stop mode to standby off mode.	Change the setting of the STOP TIMER menu item (see page 63).

Playback

This section describes the settings and operations necessary to perform playback on this unit. The same settings and operations apply whether you are using the unit as part of an editing system, for dubbing, or as a stand-alone player VCR.

For the necessary connections for playback and the settings not covered in this section, see Chapter 5 "Connections and Settings" (page 79).

Settings for Playback

Video monitor

Player (DSR-1500/1500P)
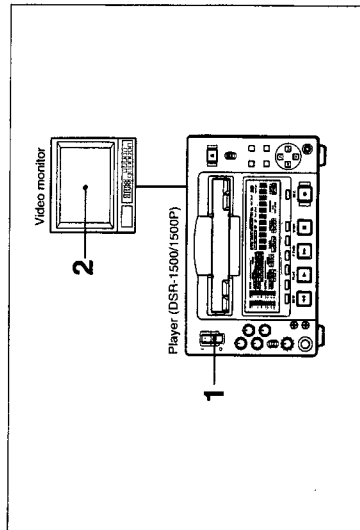
1 Power on this unit by pressing on the | side of the POWER switch.

2 Power on the video monitor and set its switches as shown below.

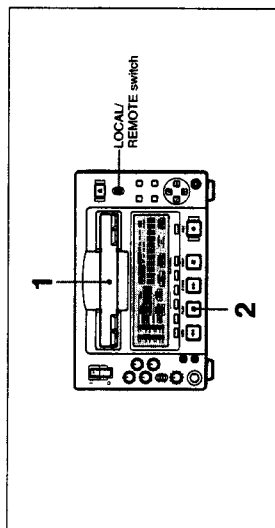| Switch	Setting
75 Ω termination switch	ON (or attach a 75 Ω terminator.)
Input switch	Set according to the type of input signal from this unit.

To perform the following operations

Operation	Do this:
Stop playback.	Press the STOP button. The unit enters stop mode, and will automatically switch to standby off mode after the time set with the STOP TIMER menu item (see page 63) for tape protection.
Adjust the audio playback level.	Use the PHONES control knob on the front panel (outputs from the PHONES connector on the front panel and the MONITOR connector on the rear panel are adjusted).
Play back in shuttle mode while monitoring the video.a)	To carry out a high-speed search (10 times normal speed) in forward or reverse direction, press the ▷ or ◁ button. To return to normal-speed playback, press the PLAY button.
Play back in jog mode while monitoring the video.a)	To carry out frame-by-frame playback in forward or reverse direction, press the △ or ▽ button. When you hold down the △ or ▽ button, playback is continued in jog mode ($-1/2$ times normal speed) in forward or reverse direction.
Inhibit the unit from outputting text information (time data, operation mode indications, etc.) to the video monitor.	Set the CHARA. DISPLAY menu item (see page 60) to OFF.
Remove the cassette.	Press the EJECT button. If a CNT value is shown in the time counter display, the CNT value is reset.
Disable the automatic rewind function.	Set the AUTO REW menu item (see page 60) to DISABLE.
Change the time period before the unit switches from stop mode to standby off mode.	Change the setting of the STOP TIMER menu item (see page 63).

a) When the SEARCH ENABLE menu item (see page 59) is set to ENABLE.

Playback Procedure

LOCAL/REMOTE switch

Note

When controlling this unit from an editing control unit connected to the REMOTE connector of this unit, set the LOCAL/REMOTE switch of this unit to REMOTE, turning the REMOTE indicator on. When not, set the switch to LOCAL, turning the indicator off.

1 Insert a cassette.

For details of cassette insertion see page 25, and for usable cassette types see page 23.

The cassette is automatically drawn into the unit and the STOP button lights. A few seconds later, if the STOP menu item (see page 59) is set to PB, a still image will appear on the monitor screen.

2 Press the PLAY button.

This starts the playback operation. When the tape is played back all the way to the end, the unit automatically rewinds it and then stops.

If the following indicators light when a cassette is loaded

Indicator	It means:
Cassette memory indicator	The loaded cassette contains a cassette memory.
CL indicator	There is ClipLink log data stored in the cassette memory on the loaded cassette.
NO EDIT indicator	The tape was recorded in the DV format, or a DVCPRO tape is inserted. You cannot use it as a recording tape for editing.

Repeat Playback—Automatic Cyclical Playback

Proceed as follows to perform automatic cyclical playback of recording (repeat playback) between selected start and end points.

1 Set the desired repeat start and end points with the REPEAT FUNCTION menu item (see page 58).
You can set points A and B as start and end points by following the procedure described in the next section.

2 Set the REPEAT MODE menu item (see page 58) to ON.

The REPEAT indicator lights.

3 Press the SET (YES) button to save the new setting and close the menu.

4 Press the PLAY button.

The unit repeats playback between the repeat start and end points set in step 1.

Setting Points A and B for Repeat Playback

You can set the repeat playback start point (point A) and end point (point B) by using the current tape position or inputting time code values.
To perform repeat playback after setting points A and B, press the PLAY button when the REMOTE indicator is off. When the DSRM-10 Remote Control Unit is connected to the CONTROL S connector on the front panel, you can also start repeat playback by pressing its PLAY button with the REMOTE indicator of this unit off.

Note
When performing repeat playback using points A and B as the playback start and end points, make sure that the REPEAT TOP and REPEAT END menu items (see page 58) are set to A POINT and B POINT, respectively.

Setting the current tape position as point A or B

Proceed as follows to set the current tape position as point A or B for repeat playback.

MENU RESET(NO)
TC PRESET SET(YES)

Buttons used for setting the current tape position as point A

Buttons used for setting the current tape position as point B
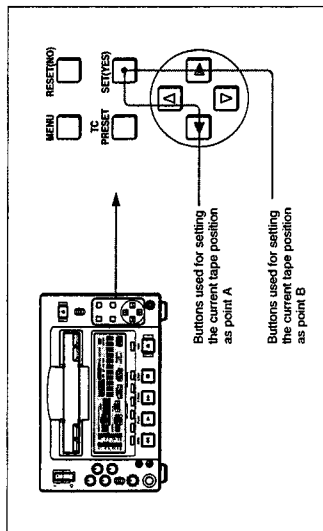
While holding down the SET (YES) button in the menu control section, press the ◁ or ▷ button. The time code value of the current tape position is set as point A or B, and a message "A set" or "B set" is displayed for 0.5 second in the time counter display.
Once set, the point A or B time code value is held in the non-volatile memory of the unit until changed. It is not lost when the unit is powered off.

Note
When setting point A or B, you can only use a time code value. Even when COUNTER is selected with the COUNTER SELECT button, you cannot use a CNT value to set point A or B.

To check the point A or B time code value
Press the ◁ or ▷ button in the menu control section. While the button is held down, the point A or B time code value is displayed on the monitor and in the time counter display.
If you hold down the ◁ and ▷ buttons simultaneously, the value shown is the point B time code value minus the point A time code value. If the point A time code value is greater than the point B time code value, a minus sign (−) is shown before the value.

3 With "OPERATIONAL FUNCTION" selected, press the ▷ button.

The display changes as follows.

>REP FUNC
Time counter display

SETUP MENU
OPERATIONAL FUNCTION
REPEAT FUNCTION
AUTO EE SELECT
LOCAL ENABLE   :STP&EJ

Monitor screen
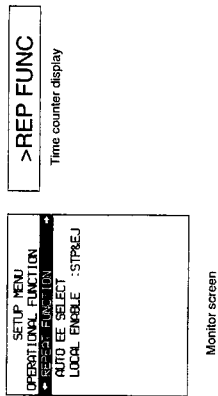
4 With "REPEAT FUNCTION" selected, press the ▷ button.

The contents of the REPEAT FUNCTION menu item are displayed.

>> REPEAT MD
Time counter display

SETUP MENU
OPERATIONAL FUNCTION
REPEAT FUNCTION
REPEAT MODE   :OFF
REPEAT TOP   :T.TOP
REPEAT END   :U.END
A PRESET
B PRESET

Monitor screen
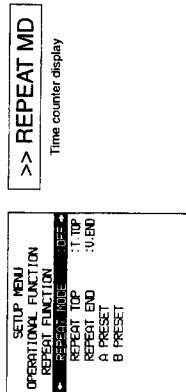
5 Press the ▽ button to select "REPEAT TOP."

>> REP TOP
Time counter display

SETUP MENU
OPERATIONAL FUNCTION
REPEAT FUNCTION
REPEAT MODE   :OFF
REPEAT TOP   :T.TOP
REPEAT END   :U.END
A PRESET
B PRESET

Monitor screen

Inputting time code values for points A and B

Using the following procedure, you can modify the time code value for point A or B.

1,15 — MENU   RESET(NO)
TC PRESET   SET(YES) — 13
▲ — 12
◀ ▶ — 2,3,4,6,10,11
8,11 — ▼
5,7,9,12

1 Press the MENU button.

The following menu display appears.

Setup menu
Time counter display

SYSTEM MENU
SETUP MENU
AUTO FUNCTION
HOURS METER

Monitor screen

2 With "SETUP MENU" selected, press the ▷ button.

The display changes as follows.

Operational
Time counter display

SETUP MENU
OPERATIONAL FUNCTION
DISPLAY CONTROL
TIME CODE
SETUP BANK OPERATION
MENU GRADE   :BASIC

Monitor screen

6 Press the ▷ button.

The display changes as follows.

```
SETUP MENU
OPERATIONAL FUNCTION
 REPEAT FUNCTION
  REPEAT TOP    :T.TOP
 × REPEAT TOP
   A POINT
```
Monitor screen

>>> Tape top

Time counter display

7 Press the ▽ button to select "A POINT."

```
SETUP MENU
OPERATIONAL FUNCTION
 REPEAT FUNCTION
  REPEAT TOP    :T.TOP
 ↑ TAPE TOP
   A POINT
```
Monitor screen

>>> A point

Time counter display

8 Press the ◁ button.

The display changes as follows.

```
SETUP MENU
OPERATIONAL FUNCTION
 REPEAT FUNCTION
  REPEAT MODE   :OFF
  REPEAT TOP    :A
  REPEAT END    :U.END
   A PRESET
   B PRESET
```
Monitor screen

>> REP TOP

Time counter display

9 Press the ▽ button to select "A PRESET."

```
SETUP MENU
OPERATIONAL FUNCTION
 REPEAT FUNCTION
  REPEAT MODE   :OFF
  REPEAT TOP    :A
  REPEAT END    :U.END
   A PRESET
   B PRESET
```
Monitor screen

>> A preset

Time counter display
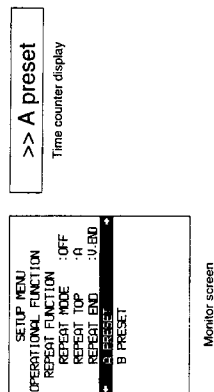
10 Press the ▷ button.

The A PRESET MODE screen appears. The time code value of the current point A is displayed below the screen title.

```
A PRESET MODE

 A  00:00:00:00

INC/DEC  : (↑)(↓)KEY
SHIFT    : (←)(→)KEY
CLEAR    : RESET KEY
DATA SAVE : SET KEY
TO MENU  : MENU KEY
```
Monitor screen
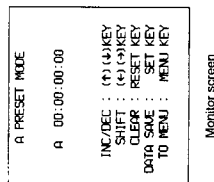
11 Use the ◁ or ▷ button to select the digit in the time code value display that you want to change.

Each press of the button causes the digit to the left or right to begin flashing. Holding the button down moves the flashing digit continuously.
If you want to clear the time code value, press the RESET (NO) button. The value is cleared to 00:00:00:00, and the leftmost digit begins flashing.

12 Press the △ or ▽ button to increment or decrement the value of the flashing digit.

Each press of the button increments or decrements the value. Holding the button down increments or decrements the value continuously. To change other digits, return to step **11**.

13 Press the SET (YES) button to confirm the defined value.

The message "NOW SAVING..." is displayed on the monitor screen and "Saving..." is shown in the time counter display while the new setting is being saved in memory.

Caution
The new setting may be lost if you power off the unit during the saving operation. Wait until the saving operation is completed before powering the unit off.

If you want to discard the changed value
Press the MENU button instead of pressing the SET (YES) button to return to the menu display, then press the MENU button again to end the menu operation without saving the changed value into memory.

After the saving operation is completed, the monitor screen and time counter display return to the REPEAT FUNCTION setting display as shown in step **9**.

14 To set point B, refer to steps **5** to **13**. (Select "REPEAT END" in step **5**, "B POINT" in step **7**, and "B PRESET" in step **9**.)

15 Press the MENU button to close the menu.

Cuing Up to Any Desired Position Set as Point A or B

You can set any desired tape position as point A or B and cue up to the set point when required. To cue up to point A or B, holding down the ◁ or ▷ button in the menu control section, press the REW button in the tape transport control section.

For the methods of setting points A and B, see the previous section.

3

Convenient Functions
for Editing Operation | Chapter

Setting the Time Data

This unit is provided with the following functions related to time data.
- Display and reset CNT value
- Set, display, record, and play back SMPTE/EBU time code and user bit data
- Set, display, record, and play back VITC

The unit can output the time code read from the tape as an analog (LTC) signal while in normal-speed playback mode, and receive an external analog time code (LTC) signal.

Note
The unit outputs no signal from the TC OUT connector unless it is in normal-speed playback mode.

The following explains how to use these functions.

Displaying Time Data and Operation Mode Indications

Time data and operation mode indications can be displayed on the monitor screen.
Time data can also be displayed in the time counter display on this unit.

To view time data and operation mode indications on the monitor screen

Set the CHARA. DISPLAY menu item (see page 60) to ON (factory default setting).
The time data and the indication of the current operation mode are superimposed on the video signal that is being output from the B–Y/CPST (SUPER) connector, and can be viewed on the monitor screen.

Use the DISPLAY CONTROL menu items (see page 60) to select the information displayed and the character type and position of the indications.

When you set the SUB STATUS menu item (see page 61) to other than OFF, you can also display supplementary status information on the monitor screen such as editing mode settings and the operating mode of the internal time code generator.

For details of supplementary status information, see "Displaying Supplementary Status Information" on page 76.

Monitor screen contents

The contents of the monitor screen are shown below.

- **a** Time data type
- Time data
- **b** Drop frame indication for time code reader [a]
- **c** Drop frame indication for time code generator [a]
- **d** VITC field indication

```
T C R  0 0 : 0 4 : 4 7 : 0 7
       P L A Y         L O C K
```

B DSR-1500/1500P operation mode
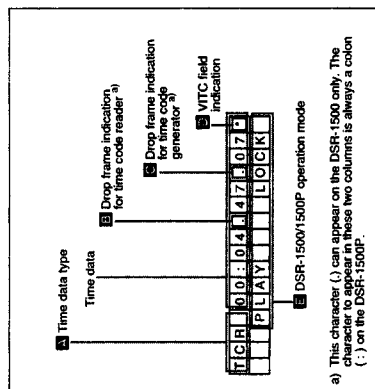
a) This character (:) can appear on the DSR-1500 only. The character to appear in these two columns is always a colon (:) on the DSR-1500P.

A Time data type

The following time data type indications are displayed.

Indication	Description
CNT	Count value of the time counter
TCR	Time code data from time code reader (factory default setting)
UBR	User bit data from time code reader
TCR.	Time code data from VITC reader [a]
UBR.	User bit data from VITC reader [a]
TCG	Time code data from time code generator
UBG	User bit data from time code generator
T*R [b]	Time code data from time code reader. The asterisk indicates an interpolation by the time code reader to make up for the time code data not correctly read from the tape.
U*R [b]	User bit data from the time code reader. The asterisk indicates that last data is retained by the time code reader, as the new data has not been read correctly from the tape.

a) You can switch between TC and VITC using the TC SELECT menu item (see page 62).
b) "*" is displayed when data cannot be read in correctly.

B Drop frame indication for time code reader (on DSR-1500 only)

.	Drop frame mode (factory default setting)
..	Non-drop frame mode

C Drop frame indication for time code generator (for DSR-1500 only)

| .	Drop frame mode (factory default setting)
..	Non-drop frame mode

D VITC field indication

(blank)	Display fields 1 and 3.
*	Display fields 2 and 4.

E DSR-1500/1500P operation mode

Display	Operation mode
CASSETTE OUT	Cassette is not loaded.
THREADING	Tape loading
UNTHREADING	Tape unloading
STANDBY OFF	Standby off mode
T. RELEASE	Tape tension released
STOP	Stop mode
F. FWD	Fast forward mode
REW	Rewind mode
PREROLL	Preroll mode
PLAY	Playback mode (servo unlocked)
PLAY LOCK	Playback mode (servo locked)
PLAY-PAUSE	Temporary stop of playback
REC	Record mode (servo unlocked)
REC LOCK	Record mode (servo locked)
REC-PAUSE	Temporary stop of recording
EDIT	Edit mode (servo unlocked)
EDIT LOCK	Edit mode (servo locked)
JOG STILL	Still picture in jog mode
JOG FWD	Jog mode in forward direction
JOG REV	Jog mode in reverse direction
SHUTTLE (Speed)	Shuttle mode
AUTO EDIT	Automatic editing mode
PREVIEW	Preview mode
REVIEW	Review mode

To display the desired time data in the time counter display

Time data type indicators

COUNTER SELECT button

Time counter display
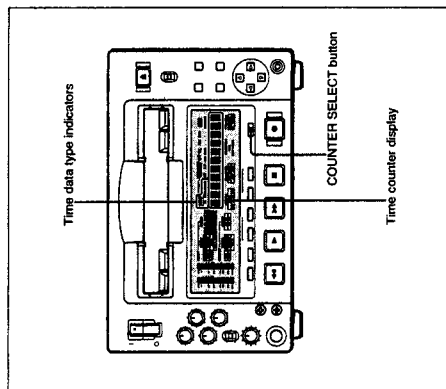
Press the COUNTER SELECT button on the front panel. Each press of this button cycles through three options: CNT value, time code, and user bit data. The time data type indicator for each option lights as it is selected.

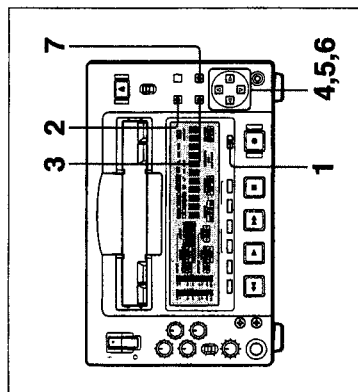| Time data type indicator	Time data shown in the time counter display
COUNTER	CNT (count value of the time counter)
TC	Time code (when recording, the time code is generated by the internal time code generator; when playing back, the time code is read from the tape.)
U-BIT	User bit data (when recording, the user bit data is according to the most recent settings; when playing back, the user bit data is read from the tape.)

Note
When the REMOTE indicator in the front panel display section is lit, the COUNTER SELECT button does not operate while the tape is moving. In such cases, use the external equipment connected to the REMOTE connector on the rear panel to select the time data.

To reset the CNT value

Press the RESET (NO) button in the menu control section. This resets the CNT value to 0:00:00:00.

Note
During playback, if the recording on the tape includes discontinuities, the counter may operate incorrectly at the corresponding points.

Using the Internal Time Code Generator

You can set the initial time code value before recording the time code generated by the internal time code generator onto a tape. In addition, you can use the user bits to record such data as the date, time, scene number, reel number, or other useful information.

When an external time code generator is connected to the TC IN connector, the internal time code generator can be locked to (synchronized with) an external time code.

To set the initial time code value and user bit data

1. Press the COUNTER SELECT button to light the time data type indicator "TC" or "U-BIT."
   TC: To set the initial time code value
   U-BIT: To set user bit data

   The current time code value or user bit data is shown in the time counter display.

2 Set the TIME CODE menu items (see page 62) as shown below.

Menu item	Setting
TC MODE	"INT PRESET"
RUN MODE	"FREE RUN" or "REC RUN"
DF MODE (for DSR-1500 only)	Normally "ON (DF)"

3 Press the TC PRESET button in the menu control section.

The current setting is shown on the monitor screen and in the time counter display on the front panel. The leftmost digit keeps flashing.

One of the following menu screens is displayed on the monitor depending on the setting made in step 1.

```
TC PRESET MODE

TCG 00:00:00:00

INC/DEC : (↑)(↓)KEY
SHIFT   : (←)(→)KEY
CLEAR   : RESET KEY
DATA SAVE : SET KEY
ABORT   : TC PRESET KEY
```
Initial time code value setting screen

```
UB PRESET MODE

UBG 00:00:00:00

INC/DEC : (↑)(↓)KEY
SHIFT   : (←)(→)KEY
CLEAR   : RESET KEY
DATA SAVE : SET KEY
ABORT   : TC PRESET KEY
```
User bit setting screen

Note
If you press the TC PRESET button while CNT value is being displayed, the message "COUNTER MODE IS SELECTED." will appear on the monitor screen and "CNT mode!" will appear in the time counter display on the front panel. If this happens, press the COUNTER SELECT button to light the time data type indicator "TC" or "U-BIT."

4 Use the ◁ and ▷ buttons to move the flashing digit to the value to be changed.

5 Use the △ and ▽ buttons to change the value of the flashing digit.

Enter hexadecimal values (0 to 9, A to F) when setting user bit data.

6 Repeat steps **4** and **5** until you have set the desired values for all digits.
To set a value of 00:00:00:00, simply press the RESET (NO) button.

7 Press the SET (YES) button.

The message "NOW SAVING..." appears on the monitor screen. "Saving..." appears in the time counter display, and the new settings are stored in memory. After this saving operation is completed, the monitor screen and the time counter display return to their usual status.

Note
The set data may be lost if you power off the unit while the above saving operation is in progress. Wait until the saving operation is completed before powering off.

Advancement of internal time code generator

The internal time code generator can advance in either of two modes, which can be set with the RUN MODE menu item (see page 62).
FREE RUN: Advancement starts when the data saving operation is completed.
REC RUN: Advancement starts when recording starts and stops when recording stops.

To set the current time as the initial time code value

In step **2** above, set the RUN MODE menu item to FREE RUN, then set the current time (format: HH:MM:SS:FF = hours: minutes:seconds:frame number) in step **3** and subsequent steps.

Synchronizing Internal and External Time Codes

The internal time code generator can be synchronized with an external time code (LTC) input to this unit.

To synchronize the internal time code to external time code

Input an external time code (LTC) signal to the TC IN connector, then set the TC MODE menu item (see page 62) to EXT REGEN.
The internal time code generator locks onto the external time code and starts advancing. Once the internal time code generator has been synchronized in this way, you can disconnect the external time code input and this unit will maintain the synchronized time code.

Note
When the selected input mode is "SDTI" or "i.LINK" (the SDTI or i.LINK indicator is lit in the INPUT signal display section), setting the TC MODE menu item to EXT REGEN causes the internal time code generator to automatically synchronize with the external time code input to the unit via the SDTI or i.LINK interface.

Once an external time code signal has been input, the internal time code advancement mode and frame count mode are automatically set as follows:
Advancement mode: FREE RUN
Frame count mode: Same as external time code (drop frame or non-drop frame)

To confirm external synchronization

Press the STOP button to put the unit into stop mode, then press the REC button.
Look at the time counter display and check that the time code value displayed there matches the external time code value.

Rerecording the Time Code—TC Insert Function

The TC insert function makes it possible to use the internal time code generator to rewrite time code or user bits when the time code recorded on a tape is discontinuous.
You can start recording time code from an initial value which can be set freely (see page 45).

Notes
• Use a tape which is recorded in the DVCAM format. (You cannot use the TC insert function with a tape recorded in DV format.)
• The time code recording starts from the current tape position. Cue the tape up beforehand to the required start position.
• If you use a tape on which ClipLink log data is recorded, the ClipLink log data will be lost.
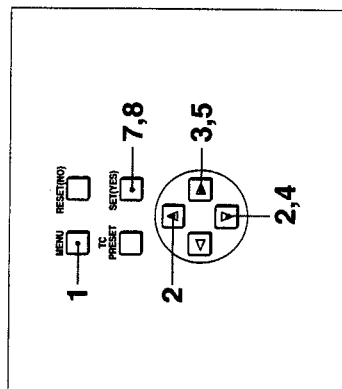
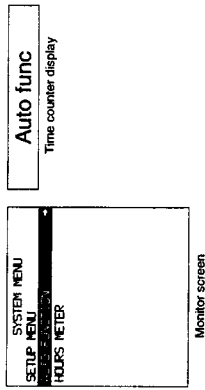**1** Press the MENU button in the menu control section.

```
SYSTEM MENU
SETUP MENU
AUTO FUNCTION
HOURS METER
```
Monitor screen
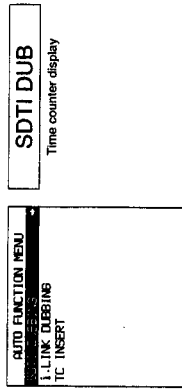
Setup menu

Time counter display
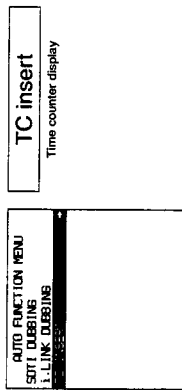
2 Press the △ or ▽ button to select "AUTO FUNCTION."

```
SYSTEM MENU
SETUP MENU
AUTO FUNCTION
HOURS METER
```
Monitor screen

Auto func
Time counter display

3 Press the ▷ button.

This displays the items in the level 1 of the auto mode execution menu.

```
AUTO FUNCTION MENU
SDTI DUBBING
i.LINK DUBBING
TC INSERT
```
Monitor screen

SDTI DUB
Time counter display

4 Press the ▽ button to select "TC INSERT."

```
AUTO FUNCTION MENU
SDTI DUBBING
i.LINK DUBBING
TC INSERT
```
Monitor screen

TC insert
Time counter display

5 Press the ▷ button.

The following message appears.

```
TC INSERT

INSERT THE TAPE IN
THIS VTR.

ABORT:MENU KEY
```
Monitor screen

Set tape!
Time counter display
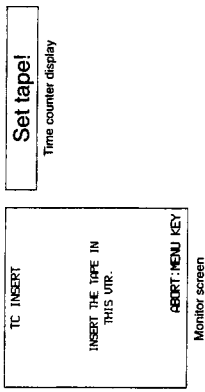
6 Insert the cassette.

A message to confirm the TC insert operation appears.

```
TC INSERT

START TC INSERT?

START:YES KEY
ABORT:MENU KEY
```
Monitor screen

TC insert?
Time counter display
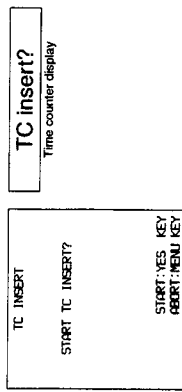
To cancel the TC insert operation
Press the MENU button.

7 Press the SET (YES) button.

Time code recording starts from the current tape position.

```
TC INSERT

EXECUTING.

TCR 00:00:00:00
UBR 00:00:00:00

ABORT:MENU KEY
```
Monitor screen

Executing
Time counter display
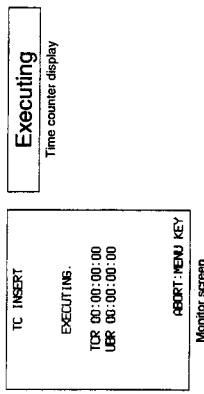
When the recording ends, the message "TC INSERT COMPLETED. PUSH THE YES BUTTON." appears on the monitor screen and "Completed" appears in the time counter display.

8 Press the SET (YES) button to exit the menu.

High-Speed and Low-Speed Search—Quickly and Accurately Determining Editing Points

Use the search function to easily locate the desired scene and to quickly and accurately determine edit points.

When F. FWD/REW under the AUTO EE SELECT menu item (see page 59) is set to PB (factory default setting), you can use the F FWD and REW buttons on this unit or external equipment for high-speed search.

Search Operations via External Equipment

You can control the unit in the following operation modes from an editing control unit (ES-7, PVE-500, etc.) connected to the REMOTE connector on the rear panel, a SIRCS-compatible remote control unit such as the DSRM-10 connected to the CONTROL S connector (on the front panel), or control equipment connected to the DV IN/OUT connector.

Shuttle: Use this mode to view color video playback at speeds ranging from 0 to 60 times normal speed in both directions.

Note

When controlling the unit from the DSRM-10 for shuttle-mode search, the maximum search speed is 16 times normal speed in both directions.

Jog: Use this mode for low-speed search and frame-by-frame search.

Digital slow: Use this mode for noise-free color video playback at speeds ranging from 0 to 1/2 times normal speed in both directions.

Still: Use this mode to view a still picture of any field.

Jog audio: Use this mode to monitor the audio at speeds ranging from 1 to 1/30 times normal speed in both directions.

Note

When controlling this unit from external equipment, set the REMOTE I/F menu item (see page 67) and the LOCAL/REMOTE switch so that the remote mode indicators in the display section are on or off as follows.

- When using an editing control unit connected to the REMOTE connector:

Switch/menu item	Setting
LOCAL/REMOTE switch	REMOTE (REMOTE indicator lights.)
REMOTE I/F menu item	9PIN (9P indicator lights.)

- When using a SIRCS-compatible remote control unit connected to the CONTROL S connector:

Switch/menu item	Setting
LOCAL/REMOTE switch	LOCAL
REMOTE I/F menu item	—

- When using equipment connected to the DV IN/OUT connector:

Switch/menu item	Setting
LOCAL/REMOTE switch	REMOTE (REMOTE indicator lights.)
REMOTE I/F menu item	i.LINK (i.LINK indicator lights.)

For description on how to carry out search operations via external equipment, see the operating instructions for the equipment.

Digitally Dubbing Signals in DVCAM Format

In addition to straightforward tape dubbing, you can also use this unit to dub automatically from the beginning of the tape to the end through the SDTI (QSDI) or i.LINK interface.

- To use the SDTI (QSDI) interface, the optional DSBK-1501 board is required.
- To use the i.LINK interface, the optional DSBK-1503 board is required.

When a tape recorded on a DSR-1/1P Digital Videocassette Recorder or DSR-130/130P Digital Camcorder is dubbed, the ClipLink log data held in the cassette memory is also copied.

Notes

- Use a tape recorded in the DVCAM format. A tape recorded in DV format cannot be used as a source tape for dubbing through the SDTI (QSDI) or i.LINK interface.
- Regardless of the audio recording mode setting of this unit, dubbing is performed with the original audio recording mode unchanged (two-channel/48 kHz mode or four-channel/32 kHz mode).
- Approximately the last 2 minutes of the tape may not be copied because of differences in tape lengths. (If an index picture is recorded in this portion, it may also not be copied.)
- A continuous recorded section of approximately 5 seconds is required before the recording start point. It is recommended to record beforehand color bars or a similar signal at the start point of the source tape to be dubbed on this unit.

**Connections for dubbing via SDTI (QSDI) interface**

To carry out dubbing through the SDTI (QSDI) interface, connect the REMOTE and SDTI (QSDI) IN/OUT connectors on this unit to those on the DSR-85/85P/80/80P/60/60P/70/70P/2000/2000P/1800/1800P/1600/1600P/1500/1500P.

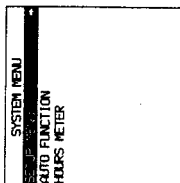For details of the connections and switch settings, see "Connections for SDTI (QSDI) Dubbing" on page 89.

Connections for dubbing via i.LINK interface

To carry out dubbing through the i.LINK interface, connect the DV IN/OUT connectors on this unit and the player.
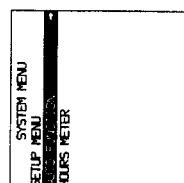

Use the following procedure.

1,9 2 3,4,5 7 2,4
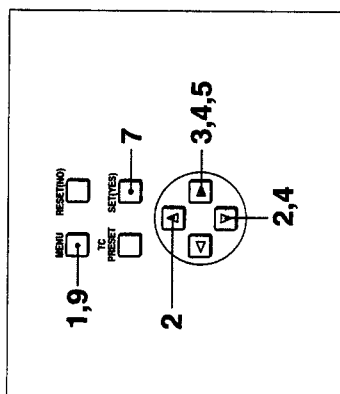
1 Press the MENU button in the menu control section.

Setup menu
Time counter display

SYSTEM MENU
SETUP MENU
AUTO FUNCTION
HOURS METER

Monitor screen

2 Press the △ or ▽ button to select "AUTO FUNCTION."

Auto func
Time counter display

SYSTEM MENU
SETUP MENU
HOURS METER

Monitor screen

3 Press the ▷ button.

This displays the items on level 1 of the auto mode execution menu.

SDTI DUB
Time counter display

```
AUTO FUNCTION MENU
SDTI DUBBING
i.LINK DUBBING
TC INSERT
```
Monitor screen

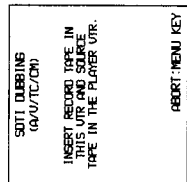**4** Press the ▷ button to display the menu level 2 for the item "SDTI DUBBING," and select the data to be dubbed with the ▽ button.

Example: Selecting "A/V/TC/CM"

>A/V/TC/CM
Time counter display

```
AUTO FUNCTION MENU
SDTI DUBBING
A/V
A/V/TC
```
Monitor screen
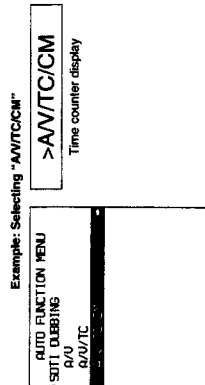
5 Press the ▷ button.

The following message appears.

Set tape!
Time counter display

```
SDTI DUBBING
(A/V/TC/CM)

INSERT RECORD TAPE IN
THIS VTR AND SOURCE
TAPE IN THE PLAYER VTR.

ABORT:MENU KEY
```
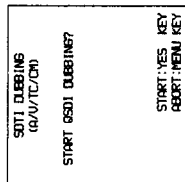Monitor screen

6 Insert the source tape in the player, and the recording tape in this unit.

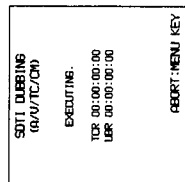A message to confirm the dubbing operation appears.

Start dub?
Time counter display

```
SDTI DUBBING
(A/V/TC/CM)

START SDTI DUBBING?

START:YES KEY
ABORT:MENU KEY
```
Monitor screen

To cancel the dubbing operation
Press the MENU button.

7 Press the SET (YES) button.

The tape is automatically wound back to the beginning, and dubbing starts.

Executing
Time counter display

```
SDTI DUBBING
(A/V/TC/CM)

EXECUTING:

TCR 00:00:00:00
UBR 00:00:00:00

ABORT:MENU KEY
```
Monitor screen

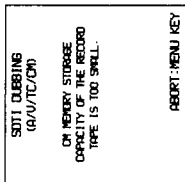**To end the dubbing operation while it is in progress**
Press the STOP button.

When the dubbing is completed, message "COMPLETED" appears on the monitor screen and "Completed" in the time counter display.
The source tape and recording tape are both automatically rewound to the beginning, and the cassettes ejected. When the cassette is ejected, this unit returns to the state in step **5**.

8 To continue by dubbing another tape, repeat steps **6** and **7**.

9 When the dubbing is completed, press the MENU button to exit the menu.

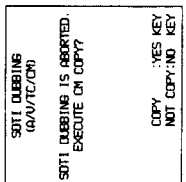**If the following message appears in step 6 for an A/V/TC/CM dubbing operation**

CM capacity!
Time counter display

```
SDTI DUBBING
(A/V/TC/CM)

CM MEMORY STORAGE
CAPACITY OF THE RECORD
TAPE IS TOO SMALL.

ABORT:MENU KEY
```
Monitor screen

When carrying out A/V/TC/CM dubbing, if you insert the cassettes in step **6**, the cassette memory capacity of the cassettes inserted in both this unit and the player are checked automatically.
If the cassette memory capacity of the source tape is larger than that of the recording tape, the above message appears. In this case, replace the recording tape by a tape with a larger cassette memory capacity.

If the following message appears in step 7 for an A/V/TC/CM dubbing operation

Copy CM?
Time counter display

```
SDTI DUBBING
(A/V/TC/CM)

SDTI DUBBING IS ABORTED.
EXECUTE CM COPY?

COPY: YES KEY
NOT COPY:NO KEY
```
Monitor screen

When carrying out A/V/TC/CM dubbing, if you press the STOP button to stop dubbing in step 7, or if dubbing stops because the source tape is longer than the recording tape, the above message appears to confirm whether or not to copy the contents of the cassette memory.
To copy the contents of the cassette memory, press the SET (YES) button.
If you do not wish to copy the contents of the cassette memory, press the RESET (NO) button. If you press the RESET (NO) button, however, the contents of the cassette memory may not agree with the material recorded on the tape.

Menu Settings | Chapter

4

Menu Organization

As shown in the following figure, the menu system consists of four levels and is functionally divided into three subsystems: the setup menu, the auto mode (AUTO FUNCTION) execution menu and the digital hours meter display menu.

This chapter mainly describes the setup menu, showing its contents and how to operate it.

For details of the AUTO FUNCTION menu, see "Digitally Dubbing Signals in DVCAM Format" on page 51 and "Rerecording the Time Code—TC Insert Function" on page 47.

For details of the digital hours meter display, see "Regular Checks" on page 93.
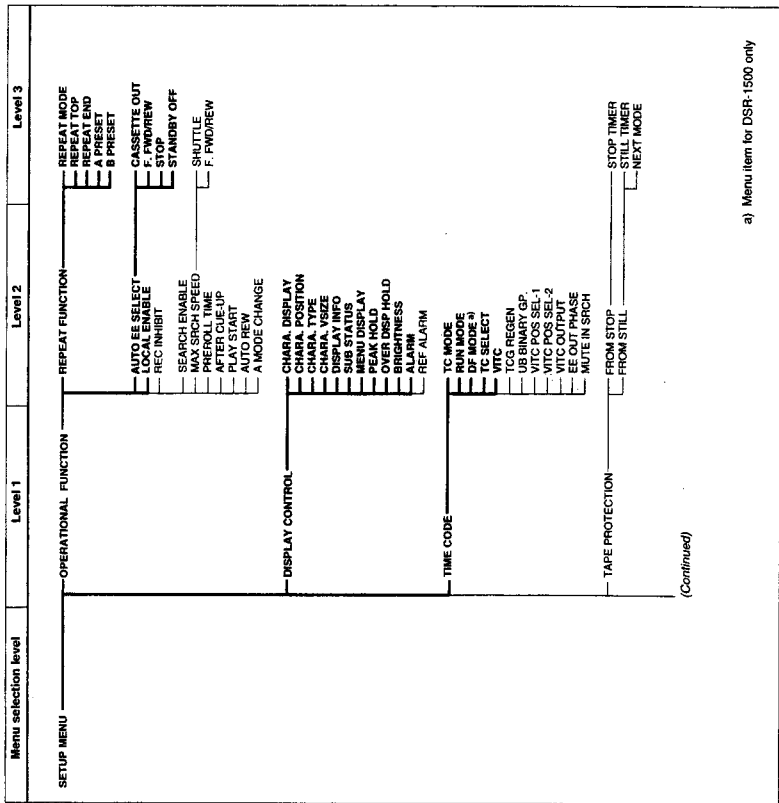
The items of the setup menu are divided into several functional groups on level 1, and except for the MENU GRADE item the settings themselves are made on level 2 or level 3.

Also, the menu items are divided into two categories according to how frequently they are accessed: the "basic" items, to which frequent access is normally required, and the "enhanced" items, which are less frequently used. In the following figure, the items shown in boldface are basic items, and the other items are enhanced items.

The menu settings are saved in non-volatile memory, which means they are not erased when you power off the unit after executing the setting operation.

Menu organization — (Continued)

Menu selection level	Level 1	Level 2	Level 3

VIDEO CONTROL
- INT VIDEO SG
- STD/NON-STD
- OUT REF SEL
- SETUP REMOVE a)
- SETUP ADD a)
- CC(F1) BLANK a)
- CC(F2) BLANK a)
- WIDE MODE
- ESR MODE
- PROCESS CONTROL
  - C PHASE MODE
  - ADJ RANGE
  - VIDEO GAIN
  - CHROMA GAIN
  - CHROMA PHASE
  - SETUP LEVEL a)
  - BLACK LEVEL b)
- INPUT BLANK b) — LINE 335

AUDIO CONTROL
- REC MODE
- INPUT ARRANGE
- LEVEL SELECT
- INT AUDIO SG
- JOG CONTROL
- SHUTTLE MUTE
- AUDIO EDIT
- DV PB ATT
  - REF LEVEL
  - CH1 IN LEVEL
  - CH2 IN LEVEL
  - OUTPUT LEVEL

INTERFACE SELECT
- VIDEO OUTPUT
- DIGITAL OUTPUT
- AUDIO OUTPUT
- REMOTE I/F

SETUP BANK OPERATION
- RECALL BANK1
- RECALL BANK2
- RECALL BANK3
- RECALL BANK4
- SAVE BANK 1
- SAVE BANK 2
- SAVE BANK 3
- SAVE BANK 4

MENU GRADE

AUTO FUNCTION
- SDTI DUBBING
  - A/V
  - A/V/TC
  - A/V/TC/CM
- i.LINK DUBBING
  - A/V
  - A/V/TC
  - A/V/TC/CM
- TC INSERT

HOURS METER
- T1:OPERATION
- T2:DRUM ROTATION
- T3:TAPE RUNNING
- CT:THREADING

a) Menu item for DSR-1500 only
b) Menu item for DSR-1500P only

Menu organization

Menu selection level	Level 1	Level 2	Level 3

SETUP MENU

OPERATIONAL FUNCTION
- REPEAT FUNCTION
  - REPEAT MODE
  - REPEAT TOP
  - REPEAT END
  - A PRESET
  - B PRESET
- AUTO EE SELECT
  - CASSETTE OUT
  - F. FWD/REW
  - STOP
  - STANDBY OFF
- LOCAL ENABLE
- REC INHIBIT
  - F. FWD/REW
- SEARCH ENABLE
- MAX SRCH SPEED
- PREROLL TIME
- AFTER CUE-UP
- PLAY START
- AUTO REW
- A MODE CHANGE
  - SHUTTLE
  - F. FWD/REW

DISPLAY CONTROL
- CHARA. DISPLAY
- CHARA. POSITION
- CHARA. TYPE
- CHARA. VSIZE
- DISPLAY INFO
- SUB STATUS
- MENU DISPLAY
- PEAK HOLD
- OVER DISP HOLD
- BRIGHTNESS
- ALARM
- REF ALARM

TIME CODE
- TC MODE
- RUN MODE
- DF MODE a)
- TC SELECT
- VITC
- TCG REGEN
- UB BINARY GP.
- VITC POS SEL-1
- VITC POS SEL-2
- VITC OUTPUT
- EE OUT PHASE
- MUTE IN SRCH

TAPE PROTECTION
- FROM STOP
  - STOP TIMER
  - STILL TIMER
  - NEXT MODE
- FROM STILL

(Continued)

a) Menu item for DSR-1500 only

Menu Contents

Setup Menu

The purpose and settings of the setup menu items are described below.

Indications of menu items and settings

- In the table below entitled "Menu contents," the indication of each menu item or setting on the monitor screen is shown first, then the indication of the same item or setting in the time counter display of this unit is shown in square brackets ([ ]).

Examples:

Indication on monitor screen	Indication in time counter display
OPERATIONAL FUNCTION	[Operational]
CASSETTE OUT	[>> Cass. out]
*EE	[>>> EE]

- Settings preceded by an asterisk (such as *EE) are factory default settings.
- In the time counter display, one to three ">" symbols may precede item or setting indications depending on the current menu level. Larger numbers of ">" symbols indicate lower menu levels.

Menu contents

OPERATIONAL FUNCTION [Operational]: Operation settings			Description of settings
REPEAT FUNCTION [> REP FUNC]: Make settings for repeat playback mode.	REPEAT MODE [>> REPEAT MD]: Determine whether or not to put the unit into repeat playback mode.		*OFF [>>> OFF]: Do not put the unit into repeat playback mode. ON [>>> ON]: Put the unit into repeat playback mode. ON [>>> FREEZE] [>>> FREEZE]: Put the unit into freeze playback mode. In this case, while the unit the unit is cueing up to the repeat start point, the freeze picture of the repeat end point is displayed.
	REPEAT TOP [>> REP TOP]: Determine whether the repeat start point is the beginning of tape or point A.		*TAPE TOP [>>> Tape top]: The repeat start point is the beginning of tape. A POINT [>>> A point]: The repeat start point is point A as set by the user.
	REPEAT END [>> REP END]: Determine whether the repeat end point is the end of the video recorded portion, the end of tape or point B.		*VIDEO END [>>> VD end]: The repeat end point is the end of the video recorded portion. TAPE END [>>> Tape end]: The repeat end point is the end of tape. B POINT [>>> B point]: The repeat end point is point B as set by the user.
	A PRESET [>> A preset]: Specify a time code value to be used as the setting of point A.		For details, see "Setting Points A and B for Repeat Playback" on page 36.
	B PRESET [>> B preset]: Specify a time code value to be used as the setting of point B.		For details, see "Setting Points A and B for Repeat Playback" on page 36.

OPERATIONAL FUNCTION [Operational]: Operation settings			Description of settings
AUTO EE SELECT [> Auto EE]: Determine whether the unit enters EE mode or PB mode when audio and video signals from other equipment are input. When this unit is used as the recorder for cut editing, it is possible to output the input audio and video signals to the monitor. This enables editing operation to be carried out using a single monitor.	CASSETTE OUT [>> Cass. out]: Operations when the cassette has been ejected		*EE [>>> EE]: Output video and audio signals received from other equipment. PB [>>> PB]: Mute video and audio signals.
	F. FWD/REW [>> F. FWD/REW]: Operations when in fast forward or rewind mode		EE [>>> EE]: Output video and audio signals received from other equipment. *PB [>>> PB]: The unit enters playback mode and outputs a playback video signal. Audio signals are muted.
	STOP [>> STOP]: Operations when in stop mode		EE [>>> EE]: Output video and audio signals received from other equipment. *PB [>>> PB]: The unit enters playback mode and outputs a still picture.
	STANDBY OFF [>> STBY OFF]: Operations when in standby off mode		EE [>>> EE]: Output video and audio signals received from other equipment. *PB [>>> PB]: The unit enters playback mode and outputs a still picture.
LOCAL ENABLE [> Local ENA]: Select which of the tape transport control buttons (EJECT, REW, PLAY, F FWD, STOP, and REC) operate when the LOCAL/REMOTE switch is set to "REMOTE."			ALL DISABLE [>> All DIS]: All of the tape transport control buttons are disabled. *STOP & EJECT [>> STOP&EJ]: Only the STOP and EJECT buttons are enabled. ALL ENABLE [>> All ENA]: All of the tape transport control buttons are enabled, and settings such as preroll time change or time data display selection are effective.
REC INHIBIT [> REC INH]: Determine whether to prohibit recording on tape.			*OFF [>> OFF]: Do not prohibit recording on tape. ON [>> ON]: Prohibit recording on tape. (The REC INH indicator in the display section lights.)
SEARCH ENABLE [> Search ENA]: Select whether to enable playback in shuttle/jog mode by the use of the arrow (△▽◁▷) buttons.			*DISABLE [>> DISABLE]: Do not enable. ENABLE [>> ENABLE]: Enable.
MAX SRCH SPEED [> Max SRCH]: Specify the maximum tape speed in search (shuttle) mode and F. FWD (fast forward)/REW (rewind) mode.	SHUTTLE [>> SHUTTLE]: Specify the maximum tape speed in search (shuttle) mode.		X60 [>>> X60]: Maximum 60 times normal speed *X32 [>>> X32]: Maximum 32 times normal speed X16 [>>> X16]: Maximum 16 times normal speed
	F. FWD/REW [>> F. FWD/REW]: Specify the maximum tape speed in F. FWD/REW mode.		MAX [>>> MAX]: No maximum tape speed is specified. *X85 [>>> X85]: Maximum 85 times normal speed X60 [>>> X60]: Maximum 60 times normal speed X32 [>>> X32]: Maximum 32 times normal speed
			Note When this item is set to MAX, the playback video signal is muted.
PREROLL TIME [> Preroll]: Set the preroll time.			15 SEC [>> 15 sec] to 0 SEC [>> 0 sec]: The preroll time can be set in one-second increments to between 0 and 15 seconds. A preroll time of at least 5 seconds is recommended when using this unit for editing. When an editing control unit such as the PVE-500 has been connected, this setting is disabled and the setting on the editing control unit is in effect. Operations such as the preroll time setting and the time data switching operation are also performed on the editing control unit. Factory default setting: 5 SEC [>> 5 sec]
AFTER CUE-UP [> After CUE]: Select the operating mode following cue-up.			*STOP [>> STOP]: Stop mode STILL [>> STILL]: Output still pictures in search mode.

OPERATIONAL FUNCTION [Operational]: Operation settings	Description of settings
PLAY START [> PLAY start]: Set the timing for switching from stop mode to playback mode. In an editing system including an editing control unit such as the PVE-500, you can adjust this setting so that the delay before switching to playback mode is the same on all the decks of the editing system. It is then no longer necessary to synchronize the decks for editing, and the preroll time can be shortened.	**16 FRAME DELAY [>> 16 delay] to 4 FRAME DELAY [>> 4 delay]:** The larger the numerical value, the longer the delay. Factory default setting: 5 FRAME DELAY [>> 5 delay] (for DSR-1500) or 4 FRAME DELAY [>> 4 delay] (for DSR-1500P)
AUTO REW [> Auto REW]: Select whether to rewind the tape automatically when recording or playback reaches the end of a tape.	**DISABLE [>> DISABLE]:** Do not rewind the tape automatically. ***ENABLE [>> ENABLE]:** Rewind the tape automatically.
A MODE CHANGE [> Aud change]: Determine whether or not to permit audio insert editing that uses a different audio recording mode (2- or 4-channel mode) from that which was used for the tape loaded in the recorder.	***OFF [>> OFF]:** Do not permit. **ON [>> ON]:** Permit.

DISPLAY CONTROL [Display]: Settings related to indications on the monitor and the unit	Description of settings
CHARA. DISPLAY [> Chara disp]: Determine whether or not to output text (such as time code values) from the B-Y/CPST (SUPER) connector.	**OFF [>> OFF]:** Do not output text. (In spite of this setting, pressing the MENU button causes menu text to be output.) ***ON [>> ON]:** Output text.
CHARA. POSITION [> Chara pos]: Set the position of text superimposed on output from the B-Y/CPST (SUPER) connector to the monitor.	Use the △▽◁▷ buttons in the menu control section to adjust the text position while watching the monitor screen. To return to level 1 of the setup menu, press the MENU button.
CHARA. TYPE [> Chara type]: Set the type of characters in text superimposed on output from the B-Y/CPST (SUPER) connector to the monitor.	Make the following settings while watching the monitor screen. ***WHITE (WITH BKGD) [>> White]:** White characters on black background **BLACK (WITH BKGD) [>> Black]:** Black characters on white background **WHITE/OUTLINE [>> W/outline]:** White characters with black outline **BLACK/OUTLINE [>> B/outline]:** Black characters with white outline
CHARA. VSIZE [> Chara size]: Determine the vertical size of characters such as time code output from the B-Y/CPST (SUPER) connector for superimposed display on the monitor.	Make the selection while watching the monitor screen. ***x1 [>> x1]:** Standard size **x2 [>> x2]:** 2 times standard size
DISPLAY INFO [> DISP Info]: Select information superimposed on output from the B-Y/CPST (SUPER) connector to the monitor.	***TIME DATA & STATUS [>> Time&STA]:** Time data and operating mode indications **TIME DATA & UB [>> Time&UB]:** Time data selected using the COUNTER SELECT button, and user bit data (When user bit data is selected using the COUNTER SELECT button, user bit data and time code are shown.) **TIME DATA & CNT [>> Time&CNT]:** Time data selected using the COUNTER SELECT button, and CNT value (When CNT is selected using the COUNTER SELECT button, CNT value and time code are shown.) **TIME DATA & TIME [>> Time&Time]:** Time data and VITC **TIME DATA ONLY [>> Time]:** Time data only **REC DATE & TIME [>> REC Date]:** The time data selected with the COUNTER SELECT button is shown in the time counter display, and the date and time of recording are shown on the monitor screen.

DISPLAY CONTROL [Display]: Settings related to indications on the monitor and the unit	Description of settings
SUB STATUS [> Sub status]: Select supplementary status information superimposed on output from the B-Y/CPST (SUPER) connector to the monitor.	***OFF [>> OFF]:** Nothing of supplementary status information **EDIT PRESET [>> Edit pre]:** Indications of the editing mode settings made from the connected editing control unit **TC MODE [>> TC mode]:** Indications of the operating mode of internal time code generator **REMAIN [>> Remain]:** Remaining capacity of the tape **AUDIO MIXING [>> Aud Mix]:** Indications of input audio mixing **ALL [>> ALL]:** All of the above-mentioned items of supplementary status information *For details of supplementary status information displayed on the monitor when a setting other than OFF is selected, see "Displaying Supplementary Status Information" on page 76.*
MENU DISPLAY [> Menu DISP]: Set the type of characters in menu text superimposed on output from the B-Y/CPST (SUPER) connector to the monitor.	Make the following settings while watching the monitor screen. ***WHITE (WITH BKGD) [>> White]:** White characters on black background **BLACK (WITH BKGD) [>> Black]:** Black characters on white background **WHITE/OUTLINE [>> W/outline]:** White characters with black outline **BLACK/OUTLINE [>> B/outline]:** Black characters with white outline
PEAK HOLD [> Peak hold]: Set the peak hold time for the audio level meters.	**1.5 SEC [1.5 sec] to OFF [>> OFF]:** Set the peak hold time in the range of OFF (no peak hold) to 1.5 seconds in 0.1 second steps. Factory default setting: OFF [>> OFF]
OVER DISP HOLD [> Hold OVER]: Determine whether or not to hold the OVER indication display on the audio level meters once the indications light.	***OFF [>> OFF]:** Do not hold the OVER indication display. **ON (HOLD) [>> ON]:** Hold the OVER indication display. **Note** With ON selected, once the display is held it will remain held unless you change the setting to OFF.
BRIGHTNESS [> Brightness]: Set the brightness of front panel indicators.	Set brightness as a percentage of the maximum. **100 % [>> 100%]** ***75 % [>> 75%]** **50 % [>> 50%]**
ALARM [> ALARM]: Determine whether alarm messages are issued or not.	**OFF [>> OFF]:** Alarm messages are not issued. ***ON [>> ON]:** Alarm messages are issued.
REF ALARM [> REF ALARM]: Determine whether alarm messages related to reference video signal are issued or not.	**OFF [>> OFF]:** Alarm messages are not issued. ***ON (LIMITED) [>> ON (Limit)]:** Alarm messages are issued only during recording mode, EE mode, and while editing. **ON [>> ON]:** Alarm messages are issued.

TIME CODE [Time code]: Settings related to the time code generator

Setting	Description of settings

TC MODE [> TC mode]: Determine the time code to use: internal time code using a preset initial value, regenerated internal time code (locked to time code read from tape), or external time code.	***INT PRESET [>> PRESET]:** Use internal time code with a preset initial value.
	INT REGEN [>> REGEN]: Use internal time code locked to time code read from tape.
	EXT REGEN [>> EXT]: Use external time code selected as follows.
	• When TC is selected
	  External time code input to the TC IN connector
	• When VITC is selected
	  The VITC time code present in the input video signal
	Note
	When the selected input mode is SDTI or i.LINK (the V-SDTI, SDTI, or i.LINK indicator is lit in the INPUT signal display section), setting this item to EXT REGEN causes the internal time code generator to automatically synchronize with the external time code input to the unit via the SDTI or i.LINK interface.

RUN MODE [> RUN mode]: Select the advancement (RUN) mode of the time code generator.	***FREE RUN [>> FREE RUN]:** Time code generator keeps running. **REC RUN [>> REC RUN]:** Time code generator only runs while recording. **Note** Set to FREE RUN when carrying out editing with an editing control unit. With the REC RUN setting, editing will not be carried out correctly.
(For DSR-1500 only) **DF MODE [> DF model]:** Select whether the time code generator and time counter operate in drop frame mode or non-drop frame mode. Normally select drop frame mode to keep in synchronization with real time. The non-drop frame mode is useful for example when using computer graphics, and working on a frame count basis.	***ON (DF) [>> ON (DF)]:** Drop frame mode **OFF (NDF) [>> OFF (NDF)]:** Non-drop frame mode
TC SELECT [> TC select]: Determine which to display in the time counter display, TC or VITC.	**VITC [>> VITC]:** Display VITC. ***TC [>> TC]:** Display TC.
VITC [> VITC]: Determine whether to record the internally generated time code as VITC.	**OFF [>> OFF]:** Do not record the internally generated time code as VITC. (VITC present in the input video signal is recorded unchanged.) ***ON [>> ON]:** Record the internally generated time code as VITC.
TCG REGEN [> TCG regen]: Select the signal to be regenerated when the time code generator is in the regeneration mode (i.e., when the TC MODE menu item is set to INT REGEN or EXT REGEN).	***TC & UB [>> TC & UB]:** Both the time code and user bits are regenerated. **TC [>> TC]:** Only the time code is regenerated. **UB [>> UB]:** Only the user bits are regenerated.
UB BINARY GP. [> Binary Gp.]: Select the user bit binary group flag of the time code generator. **Note** When the TC MODE menu item is set to EXT REGEN, the user-bit binary group flag setting follows the setting on the time code input to this unit.	***000: NOT SPECIFIED [>> 000]:** Character set not specified **001: ISO CHARACTER [>> 001]:** 8-bit characters conforming to ISO 646 and ISO 2022 **010: UNASSIGNED-1 [>> 010]:** Undefined **011: UNASSIGNED-2 [>> 011]:** Undefined **100: UNASSIGNED-3 [>> 100]:** Undefined **101: PAGE/LINE [>> 101]:** Multiplex **110: UNASSIGNED-4 [>> 110]:** Undefined **111: UNASSIGNED-5 [>> 111]:** Undefined
VITC POS SEL-1 [> VITC pos-1]: Select a line to insert the VITC in. **Note** You can insert the VITC signal in two places. To insert it in two places, set both this item and also VITC POS SEL-2.	(For DSR-1500) **20 LINE [>> 20 line] to 12 LINE [>> 12 line]:** Select any line from 12 to 20. **Factory default setting: 16 LINE [>> 16 line]** (For DSR-1500P) **22 LINE [>> 22 line] to 9 LINE [>> 9 line]:** Select any line from 9 to 22. **Factory default setting: 19 LINE [>> 19 line]**
VITC POS SEL-2 [> VITC pos-2]: Select a line to insert the VITC in. **Note** You can insert the VITC signal in two places. To insert it in two places, set both this item and also VITC POS SEL-1.	(For DSR-1500) **20 LINE [>> 20 line] to 12 LINE [>> 12 line]:** Select any line from 12 to 20. **Factory default setting: 18 LINE [>> 18 line]** (For DSR-1500P) **22 LINE [>> 22 line] to 9 LINE [>> 9 line]:** Select any line from 9 to 22. **Factory default setting: 21 LINE [>> 21 line]**
VITC OUTPUT [> VITC out]: Select the time code to be output as VITC.	**OFF [>> OFF]:** Do not output VITC. **TC [>> TC]:** Output TC after converting it into VITC. ***VITC [>> VITC]:** Output VITC.
EE OUT PHASE [> EE out]: Determine the output phase for the LTC signal output from the TC OUT connector when recording time code and in STOP REC mode (forced EE mode).	***MUTE [>> mute]:** Mute the output. **THROUGH [>> through]:** Output the time code input to the TC IN connector as it is. (See example configuration on page 69.) **VIDEO INPUT PHASE [>> V input]:** Output the time code with the same phase as the input video signal phase. (See example configuration on page 69.) **VIDEO OUTPUT PHASE [>> V output]:** Output the time code with the same phase as the output video signal phase. (See example configuration on page 70.)
MUTE IN SRCH [> Mute in SR]: Select whether to mute the output from the TC OUT connector in search (jog/shuttle) mode.	**OFF [>> OFF]:** Do not mute. ***ON [>> ON]:** Mute.

TAPE PROTECTION [Tape protct]: Settings related to tape and video head protection

Setting	Sub-item	Description of settings
FROM STOP [> From STOP]: Set the time to switch from stop mode to tape protection mode.	**STOP TIMER [>> STP timer]:** Set the time to switch from stop mode to tape protection mode.	**0.5 SEC [>>> 0.5 sec] to 5 MIN [>>> 5 min]:** Select time from 12 settings ranging from 0.5 second to 5 minutes in steps of 0.1 second. **Factory default setting: 1 MIN [>>> 1 min]**
FROM STILL [> From STILL]: Set the time to switch from still search mode to tape protection mode. Also select the type of tape protection mode.	**STILL TIMER [>> STL timer]:** Set the time to switch from still search mode to tape protection mode.	**0.5 SEC [>>> 0.5 sec] to 5 MIN [>>> 5 min]:** Select time from 12 settings ranging from 0.5 second to 5 minutes in steps of 0.1 second. **Factory default setting: 1 MIN [>>> 1 min]**
	NEXT MODE [>> Next mode]: Select the type mode to follow still search mode when the time set with the STILL TIMER menu item elapses.	***STEP FWD [>>> Step]:** The tape is advanced at $\frac{1}{30}$ times normal speed for about 2 seconds. **STANDBY OFF [>>> STANDBY]:** Standby off mode

VIDEO CONTROL [Video]: Settings related to video control

PROCESS CONTROL [> Proc ctrl]		Description of settings
	C PHASE MODE [>> C Phas MD]: Select the phase rotation mode for chroma phase control. The effect of this setting applies to the output levels of all of the composite video, S-video, SDI and component video signals.	*U/V (COMPOSITE) [>>> Cmpst]: Select this setting when observing the composite video output level using a composite vectorscope. PB/PR (COMPONENT) [>>> Cmpnt]: Select this setting when observing the component video output level using a component vectorscope.
	ADJ RANGE [>> Adj range]: Select the variable range of the VIDEO and CHROMA gains.	*-3 to +3 (dB) [>>> -3/+3]: -3 dB to +3 dB WIDE [>>> wide]: -∞ to +3 dB
	VIDEO GAIN [>> V gain]: Adjust the video output level.	000 [>>> 000] to 3FF [>>> 3FF] Factory default setting: 200H
	CHROMA GAIN [>> C gain]: Adjust the chroma output level.	000 [>>> 000] to 3FF [>>> 3FF] Factory default setting: 200H
	CHROMA PHASE [>> C phase]: Adjust the chroma phase.	00 [>>> 00] to FF [>>> FF] Factory default setting: 80H
	(For DSR-1500 only) SETUP LEVEL [>> Setup lev]: Adjust the black setup level.	000 [>>>000] to 3FF [>>> 3FF] Factory default setting: 200H
	(For DSR-1500P only) BLACK LEVEL [>> Black lev]: Adjust the black level.	000 [>>> 000] to 3FF [>>> 3FF] Factory default setting: 200H
(For DSR-1500P only) INPUT BLANK [> Input blnk]	LINE 335 [>> Line 335]: Switch blanking on or off for the 335th line of the input video signal.	BLANK [>>> blank]: Blank. THROUGH [>>> through]: Do not blank.

AUDIO CONTROL [Audio]: Settings related to audio control

REC MODE [> REC mode]: Select the audio recording mode.	Description of settings
	*2 CHANNEL (48kHz) [>>> 2 ch]: 2-channel, 48-kHz mode 4 CHANNEL (32kHz) [>>> 4 ch]: 4-channel, 32-kHz mode

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VIDEO CONTROL [Video]: Settings related to video control

	Description of settings
INT VIDEO SG [> Video SG]: Select the test signal to be output from the internal test signal generator. When SG is selected using the VIDEO button in the video/audio input setting section, the internal test signal generator outputs the selected test signal. This signal can be recorded.	(For DSR-1500) *75% COLOR BARS [>> 75% bars]: 75% color bar signal BLACK BURST [>> BB]: Black burst signal (For DSR-1500P) *100% COLOR BARS [>> 100% bars]: 100% color bar signal 75% COLOR BARS [>> 75% bars]: 75% color bar signal BLACK BURST [>> BB]: Black burst signal
STD/NON-STD [> STD/N-STD]: Select the STD or NON-STD mode in accordance with the composite video or S-video input.	*FORCED STD [>> STD]: The STD mode is always used (forced STD mode). FORCED NON-STD [>> NON-STD]: Use this setting when the input video signal is unstable (forced NON-STD mode).
OUT REF SEL [> Out Ref]: Select the reference video signal to use.	*REF VIDEO [>> REF]: Use the signal input to a REF. VIDEO IN connector as the reference video signal. The input video signal to be edited is required to be in synchronization with the reference video signal. INPUT VIDEO [>> INPUT]: Use the input video signal selected with the VIDEO button in the video/audio input setting section.
(For DSR-1500 only) SETUP REMOVE [> Setup rmv]: Determine whether or not to remove black setup (7.5 IRE) from input analog video signals when converting them into digital signals.	*OFF [>> OFF]: Do not remove black setup. ON (REMOVE) [>> ON]: Remove black setup.
(For DSR-1500 only) SETUP ADD [> Setup add]: Determine whether or not to add black setup to analog video output signals.	*OFF [>> OFF]: Do not add black setup. ON (ADD) [>> ON]: Add black setup.
(For DSR-1500 only) CC(F1) BLANK [> CC1 blank]: Select whether to mute the closed caption signal to be superimposed on the 1st field of the output video signal.	*OFF [>> OFF]: Do not mute. ON [>> ON]: Mute.
(For DSR-1500 only) CC(F2) BLANK [> CC2 blank]: Select whether to mute the closed caption signal to be superimposed on the 2nd field of the output video signal.	*OFF [>> OFF]: Do not mute. ON [>> ON]: Mute.
WIDE MODE [> Wide mode]: Determine whether to retain wide-screen aspect ratio information accompanying video being recorded or played back.	*AUTO [>> Auto]: When video being recorded or played back is accompanied by wide-screen aspect ratio information, retain the information. OFF [>> OFF]: Ignore wide-screen aspect ratio information. ON [>> ON]: Whenever recording or playing back video, retain wide-screen aspect ratio information.
ESR MODE [> ESR mode]: Select whether to enable the edge subcarrier reducer (ESR).	*OFF [>> OFF]: Do not enable. ON [>> ON]: Enable. When playing back a composite signal, set this to ON.

AUDIO CONTROL [Audio]: Settings related to audio control

INPUT ARRANGE [> Input arng]: Make settings for input audio mixing.

Note
When, in 4-channel mode, analog audio is selected for all four channels (channels 1/2 and 3/4), the same analog audio signals are recorded on channels 1 and 3 and on channels 2 and 4, respectively. That is, the analog signal recorded on channel 1 is also recorded on channel 3 and the analog signal recorded on channel 2 is also recorded on channel 4.
You can adjust the audio level on each of the four channels separately using the REC/PB LEVEL control knobs with the VAR switch set to REC.

Description of settings:
Make settings using the △∇◁▷ buttons to move the cursor and the SET (YES) button to toggle the setting on and off.

① Input audio channel 1 ("in1") is recorded on audio channel 1 ("ch1") on tape.
② Input audio channels 2 and 4 ("in2" and "in4") are recorded mixed on audio channel 2 ("ch2") on tape.
③ Input audio channel 3 ("in3") is recorded on audio channel 3 ("ch3") on tape.
④ Input audio channel 4 ("in4") is recorded on audio channel 4 ("ch4") on tape.

LEVEL SELECT [> Level Sel]

REF LEVEL [>> REF Level]: Select the audio reference level (headroom) for recording on tape.
*-20 dB [>>> -20dB] (factory default setting for DSR-1500)
*-18 dB [>>> -18dB] (factory default setting for DSR-1500P)
-16 dB [>>> -16dB]
-12 dB [>>> -12dB]

CH1 IN LEVEL [>> CH1 input]: Select the audio level setting according to the audio level of the signal input to the AUDIO IN 1/3 connector.
*+4 dBm [>>> +4dBm]
0 dBm [>>> 0dBm]
-3 dBm [>>> -3dBm] (for DSR-1500P only)
-6 dBm [>>> -6dBm]

CH2 IN LEVEL [>> CH2 input]: Select the audio level setting according to the audio level of the signal input to the AUDIO IN 2/4 connector.
*+4 dBm [>>> +4dBm]
0 dBm [>>> 0dBm]
-3 dBm [>>> -3dBm] (for DSR-1500P only)
-6 dBm [>>> -6dBm]

OUTPUT LEVEL [>> Out Level]: Select the analog audio output reference level.
*+4 dB [>>> +4dB]
0 dB [>>> 0dB]
-3 dB [>>> -3dB] (for DSR-1500P only)
-6 dB [>>> -6dB]

INT AUDIO SG [> Audio SG]: Select the operation of the internal audio test signal generator.
SILENCE [>> silence]: Silent signal
*1kHz SINE [>> 1kHz]: 1-kHz, -20 dB FS (for DSR-1500) or -18 dB FS (for DSR-1500P) sine wave signal
When you select SG (audio test signal) as the audio input in the video/audio input setting section on the front panel, the audio test signal generated by the internal audio test signal generator is output.

JOG CONTROL [> Jog ctrl]: Select whether to adjust the audio playback speed during slow playback.
*OFF [>> OFF]: Do not adjust the audio playback speed.
*ON [>> ON]: Adjust the audio playback speed.

SHUTTLE MUTE [> Shutl mute]: Set the audio muting conditions during shuttle playback.
*OFF [>> OFF]: Not muted.
CUEUP or PREROLL [>> CUEUP]: Muted during cue-up or preroll operations.
FULL [>> FULL]: Muted in shuttle mode.

AUDIO CONTROL [Audio]: Settings related to audio control

AUDIO EDIT [> Audio edit]: Specify the type of editing for audio signals.
*CUT EDIT [>> Cut edit]: Cut editing (Discontinuity in audio signal may result at the editing point, causing noise during playback.)
FADE IN/OUT [>> Fade]: Fade in and fade out

DV PB ATT [> DV PB ATT]: When playing back a tape recorded in consumer DV format, select whether to attenuate the audio output level.
OFF [>> OFF]: Do not attenuate.
*ON [>> ON]: Attenuate.

INTERFACE SELECT [Interface]: Settings related to external interfaces

VIDEO OUTPUT [> Video Out]: Select the format of analog video signals to be output from the three VIDEO OUT connectors (Y/C/CPST, R-Y/C/CPST, and B-Y/CPST (SUPER)).
*COMPOSITE [>> Composite]: Composite video signals
S-VIDEO [>> S-Video]: S-video (separated Y and C) and composite video signals
Y-R, B [>> Y-R, B]: Y, R-Y and B-Y component video signals

Note
When this menu item is set to Y-R, B, the B-Y/CPST (SUPER) connector outputs the B-Y signal. In this case, changing the setting of an internal switch allows the text data for superimposition on the monitor screen to be output from the right-hand REF. VIDEO IN connector (marked **). For more information about this, consult your Sony dealer.

DIGITAL OUTPUT [> Digit Out]: Select the format of signals to be output from the SDI/SDTI (QSDI) OUT1/OUT2 connectors (optional DSBK-1501 board required).
*SDI [>> SDI]: SDI format
SDTI [>> SDTI]: SDTI (QSDI) format

AUDIO OUTPUT [> Audio Out]: Select the channels for audio output from the AUDIO OUT 1/3 and 2/4 connectors.
*1/2 CH [>> 1/2CH]: Output channel 1 to the AUDIO OUT 1/3 connector and channel 2 to the AUDIO OUT 2/4 connector.
3/4 CH [>> 3/4CH]: Output channel 3 to the AUDIO OUT 1/3 connector and channel 4 to the AUDIO OUT 2/4 connector.

REMOTE I/F [> Remote I/F]: When remote-controlling this unit with the LOCAL/REMOTE switch set to REMOTE, select either the REMOTE connector or DV IN/OUT connector (optional DSBK-1501 board required) for connecting a remote control unit.
*9PIN [>> 9PIN]: Remote-control via the REMOTE connector.
I.LINK [>> I.LINK]: Remote-control via the DV IN/OUT connector.

SETUP BANK OPERATION [Setup Bank]: Settings related to menu bank operations

RECALL BANK1 [> Recall 1]: Recall menu settings from menu bank 1.
RECALL BANK2 [> Recall 2]: Recall menu settings from menu bank 2.
RECALL BANK3 [> Recall 3]: Recall menu settings from menu bank 3.
RECALL BANK4 [> Recall 4]: Recall menu settings from menu bank 4.

Description of settings:
(1) Select the bank you want to recall, then press the ▷ button.
Message "RECALL OK?" appears.
(2) To recall, press the SET (YES) button.
To quit recalling, press the RESET (NO) button.
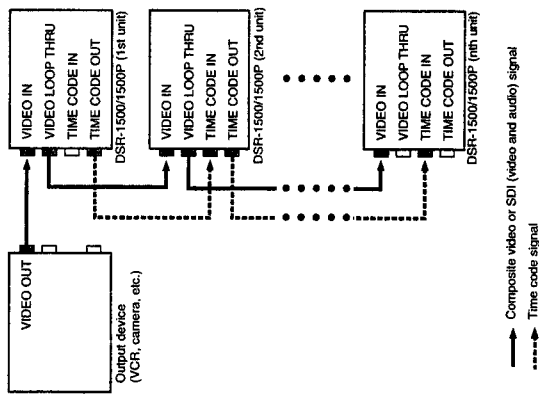
VIDEO INPUT PHASE mode

The time code output signal is synchronized with the input video signal.

This mode is appropriate when the output from a single device is recorded on a number of VCRs. The connections are loop-through connections.

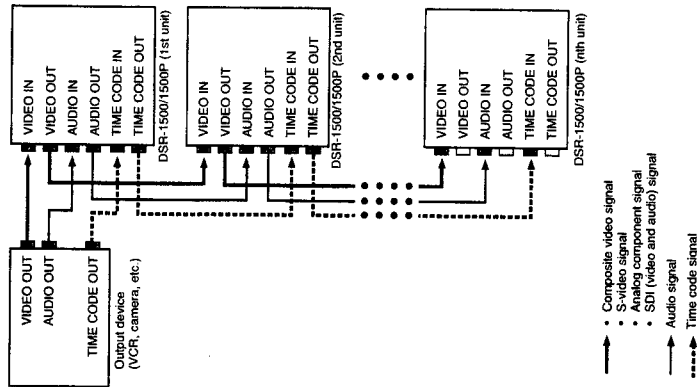In this mode, the same time code is recorded on all of the VCRs 1 to n.

Note

The optional boards (see page 7) corresponding to the input signal formats to be used are required.

VIDEO OUT

Output device
(VCR, camera, etc.)

VIDEO IN
VIDEO LOOP THRU
TIME CODE IN
TIME CODE OUT
DSR-1500/1500P (1st unit)

VIDEO IN
VIDEO LOOP THRU
TIME CODE IN
TIME CODE OUT
DSR-1500/1500P (2nd unit)

VIDEO IN
VIDEO LOOP THRU
TIME CODE IN
TIME CODE OUT
DSR-1500/1500P (nth unit)

↑ Composite video or SDI (video and audio) signal
---▶ Time code signal

EE OUT PHASE settings for time code output

Use the following as reference information when setting the EE OUT PHASE menu item (see page 63).

THROUGH mode

In this mode, the LTC signal is output with the phase synchronized with the input time code signal. This mode is appropriate when recording signals from multiple devices on a number of VCRs.

When the camcorder is in genlock mode, the time code precision is ±0 frames. When the camcorder is not in genlock mode, it is ±1 frame.

Note

The optional boards (see page 7) corresponding to the input signal formats to be used are required.

VIDEO IN
AUDIO IN
TIME CODE IN
TIME CODE OUT
DSR-1500/1500P (1st unit)

Camcorder 1

VIDEO IN
AUDIO IN
TIME CODE IN
TIME CODE OUT
DSR-1500/1500P (2nd unit)

Camcorder 2

VIDEO IN
AUDIO IN
TIME CODE IN
TIME CODE OUT
DSR-1500/1500P (nth unit)

Camcorder n

↑ Composite video or S-video signal
↑ Audio signal
---▶ Time code signal

SETUP BANK OPERATION [Setup Bank]: Settings related to menu bank operations	Description of settings
SAVE BANK 1 [▷ Save 1]: Save current menu settings to menu bank 1.	(1) Select the bank you want to save, then press the ▷ button.
SAVE BANK 2 [▷ Save 2]: Save current menu settings to menu bank 2.	Message "SAVE OK?" appears.
SAVE BANK 3 [▷ Save 3]: Save current menu settings to menu bank 3.	(2) To save, press the SET (YES) button. To quit saving, press the RESET (NO) button.
SAVE BANK 4 [▷ Save 4]: Save current menu settings to menu bank 4.	

Menu banks
This unit allows four different complete sets of menu settings to be saved in what are termed "menu banks" numbered 1 to 4. Saved sets of menu settings can be recalled for use as required.

MENU GRADE [Menu grade]: Selection of menu items to be displayed	Description of settings
Determine whether to display basic items only or both basic and enhanced items on the monitor screen and in the time counter display when using the menu.	**BASIC [▷ Basic]**: Display basic items only. **ENHANCED [▷ Enhanced]**: Display both basic and enhanced items.

VIDEO OUTPUT PHASE mode

The time code output signal is synchronized with the output video signal.

This mode is appropriate when outputting signals from a single device to a number of VCRs using separate cables for video, audio, and time code.

In this mode, the same time code is recorded on all of the VCRs 1 to n.

Note

The optional boards (see page 7) corresponding to the input signal formats to be used are required.

→ : Composite video signal
→ : S-video signal
→ : Analog component signal
→ : SDI (video and audio) signal
→ Audio signal
---→ Time code signal

Auto Mode (AUTO FUNCTION) Execution Menu

The following table shows the purpose and function of the items in the auto mode execution menu.

For details of the use of individual items, see "Digitally Dubbing Signals in DVCAM Format" on page 51 and "Rerecording the Time Code—TC Insert Function" on page 47.

Menu contents

SDTI DUBBING [SDTI DUB]: Selection of data for SDTI dubbing	Settings
For dubbing through the SDTI (QSDI) interface, select data that the dubbing applies to.	A/V [> A/V]: Dub the audio and video. A/V/TC [> A/V/TC]: Dub the audio, video, and time code. A/V/TC/CM [> A/V/TC/CM]: Dub the audio, video, time code, and cassette memory contents. **Note** When A/V is selected, the time code recorded follows the setting of the TIME CODE menu items (see page 62) in the setup menu.

i.LINK DUBBING [i.LINK DUB]: Selection of data for i.LINK dubbing	Settings
For dubbing through the i.LINK interface, select data that the dubbing applies to.	A/V [> A/V]: Dub the audio and video. A/V/TC [> A/V/TC]: Dub the audio, video, and time code. A/V/TC/CM [> A/V/TC/CM]: Dub the audio, video, time code, and cassette memory contents. **Note** When A/V is selected, the time code recorded follows the setting of the TIME CODE menu items (see page 62) in the setup menu.

TC INSERT [TC insert]: Time code rewriting	Settings
Rewrite the time code from an initial value which can be set freely.	—

Changing Menu Settings

This section explains how to change menu settings.

Buttons Used to Change Settings

Use the following buttons in the menu control section to change the menu settings.

Menu control buttons	Functions
MENU button	• Opens the menu and launches menu control mode. • Closes the menu and exits menu control mode.
Δ and ∇ buttons	These buttons move the highlighted cursor up and down within the current level to select an item or setting. Hold down one of these buttons to make the highlighted cursor move continuously.
◁ and ▷ buttons	• Press the ▷ button to go down one level. • Press the ◁ button to go up one level. Hold down one of these buttons to make the highlighted cursor move continuously.
RESET (NO) button	• Returns the setting to the factory default setting. • Sends a negative response to prompts on the monitor screen.
SET (YES) button	• Saves the new setting in memory. • Sends a positive response to prompts on the monitor screen.

Changing the Settings of Basic Items

The factory default setting is to display only the basic items. To change the settings of basic items proceed as follows.
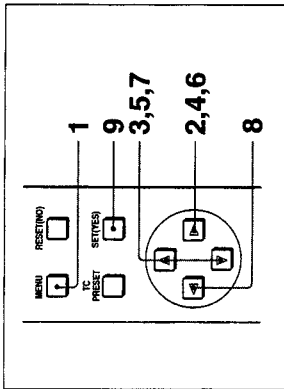
1 Press the MENU button in the menu control section.

The menu selection level display appears on the monitor.

In the figure below, "SETUP MENU" is selected (shown in reverse video).

The time counter display of this unit shows only the currently selected item. When the item name is long, it is abbreviated.

Menu selection level display

Setup menu | Time counter display

Monitor screen
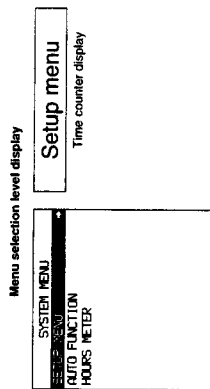
2 With "SETUP MENU" selected, press the ▷ button.

This displays all items on menu level 1.

Level-1 menu display

Operational | Time counter display

Monitor screen

3 Press the Δ or ∇ button to select the required item.

Example: Display when "DISPLAY CONTROL" is selected

Display | Time counter display

Monitor screen

4 Press the ▷ button.

This displays menu level 2 for the menu item selected in step 3.

Example: Level-2 display for "DISPLAY CONTROL"

> Chara disp | Time counter display

Current settings

Monitor screen

5 Press the Δ or ∇ button to select the item whose setting you wish to change.

For menu items on level 3, press the ▷ button to go to level 3, then press the Δ or ∇ button to select the item whose setting you wish to change.

Example: Display when "BRIGHTNESS" is selected

> Brightness | Time counter display

6 Press the ▷ button.

This displays all possible settings for the item selected in step 5.

>> 75% | Time counter display

Monitor screen

7 Press the Δ or ∇ button to change the setting of the item.

>> 50% | Time counter display

Monitor screen

To return all settings to their factory default settings

1 Press the MENU button in the menu control section.

The menu selection level display appears on the monitor screen.

2 Press the ▷ button to display level 1 of the setup menu.

3 Press the RESET (NO) button.

A message appears, to confirm whether or not you wish to return all settings to their factory default settings.

Monitor screen message	Message in the time counter display
INITIALIZE ALL ITEMS TO FACTORY PRESET VALUES?	Init setup?

4 Press the SET (YES) button.

The message "NOW SAVING..." appears on the monitor screen, and "Saving..." appears in the time counter display, while the settings of all items are returned to their factory default settings. These factory default settings are saved in memory.

Note
If you power off the unit while settings are being saved, settings may not be correctly returned to their factory default settings. Wait until the saving is completed before powering off the unit.

To abandon the resetting operation
Instead of pressing the SET (YES) button, press the RESET (NO) button. The display returns to menu level 1, leaving the settings unchanged.

---

2 With "SETUP MENU" selected, press the ▷ button.

This displays all basic and enhanced items on menu level 1.

Level-1 menu display

```
SETUP MENU
OPERATIONAL FUNCTION
DISPLAY CONTROL
TIME CODE
TAPE PROTECTION
VIDEO CONTROL
AUDIO CONTROL
DIGITAL PROCESS
SETUP BANK OPERATION
```

Menu grade — Time counter display

Current setting

Monitor screen

3 Follow the same procedure as in steps 3 to 8 of the procedure in the section "Changing the Settings of Basic Items" (page 72) using the △▽◁▷ buttons to select an item and change its setting.

4 When you have completed the settings, press the SET (YES) button.

The message "NOW SAVING..." appears on the monitor screen, and "Saving..." appears in the time counter display, while the new settings are saved in memory.
When the saving operation is completed, the monitor screen and time counter display return to their normal indications.

Returning Menu Settings to Their Factory Default Settings

After making menu setting changes, to return settings to their factory default settings (setting initialization), use the following procedure.

To return a particular setting to its factory default setting

In the section "Changing the Settings of Basic Items" (page 72), carry out the procedure up to step 6, then with the current setting displayed (in the example, if the factory default setting has been changed, the current setting will be 100% or 50%), proceed as follows.

1 Either press the RESET (NO) button or select the default setting using the △ or ▽ button.

2 Press the SET (YES) button.

The setting returned to its factory default is saved in memory as the current setting.

---

8 To change other settings, press the ◁ button to return to the previous screen, then repeat steps 5 to 7 as required.

9 When you have completed the settings, press the SET (YES) button.

The message "NOW SAVING..." appears on the monitor screen, and "Saving..." appears in the time counter display, while the new settings are saved in memory.
When the saving operation is completed, the monitor screen and time counter display return to their normal indications.

Notes
- If you power off the unit before saving operation is completed, settings may be lost. Wait until the saving is completed before powering off the unit.
- If, instead of pressing the SET (YES) button, you press the MENU button, the new settings are not saved. The message "ABORT !" appears on the monitor screen and "Abort !" in the time counter display for about 0.5 second, and the system exits the menus. To change more than one setting, be sure to press the SET (YES) button after making the settings.

Meanings of indications on the monitor screen

On-screen indication	Meaning
Right-pointing arrow (→) at the right of a menu item. See step 1 of the foregoing operating procedure.	Pressing the ▷ button switches to the next lower menu level or to a setting selection screen.
Left-pointing arrow (←) at the left of a menu item. See step 4 of the foregoing operating procedure.	Pressing the ◁ button returns to the previous (higher) menu level.
Character string at the right of a menu item. See step 4 of the foregoing operating procedure.	Current setting of the menu item. When shown with a colon (:): the current setting is the same as the factory default setting. When shown with a raised dot (•): the current setting is different from the factory default setting. See step 2 of the operating procedure in "Changing the Settings of Enhanced Items."
An asterisk in a complete list of settings. See step 6 of the foregoing operating procedure.	Factory default setting

---

Displaying Enhanced Items

The factory default setting is not to display enhanced items.
To display enhanced items, set the MENU GRADE menu item (see page 68) to ENHANCED, following the procedure in the previous section "Changing the Settings of Basic Items." (In step 3, first select "MENU GRADE," and next select "ENHANCED," then press the SET (YES) button to save the setting in memory.)
With this done, when you press the MENU button and the ▷ button to display the setup menu, all basic and enhanced items on menu level 1 appear.

Changing the Settings of Enhanced Items

To change the settings of enhanced items, first carry out the procedure in the previous section "Displaying Enhanced Items," then proceed as follows.

1 Press the MENU button in the menu control section.

The menu selection level display appears on the monitor.

Displaying Supplementary Status Information

When you set the SUB STATUS menu item (see page 61) to other than OFF, you can view supplementary status information on the monitor screen below the operating mode display area.

```
T C R   0 0 : 0 4 : 4 7 : 0 7
        P L A Y        L O C K
  I N S  V  A 1 2 3 4      T C
```
Supplementary status information

The following items of supplementary status information are displayed depending on the setting of the SUB STATUS menu item.

Setting of SUB STATUS menu item	Items of supplementary information displayed
EDIT PRESET	Editing mode settings made on the editing control unit
TC MODE	Operating mode of the internal time code generator
REMAIN	Remaining capacity of the tape
AUDIO MIXING	Setting for input audio mixing
ALL	All of the above items

The following tables show the on-screen indications of supplementary information and their meaning. In each table, the indications given in brackets such as [ASM] are the indications displayed when the SUB STATUS menu item is set to ALL.

For the display format when ALL is selected, see the next section.

When the SUB STATUS menu item is set to EDIT PRESET:

On-screen indication	Meaning
ASM [ASM]	Assemble editing mode
INS V A1234 TC [V1234T]	INS: Insert editing mode V A1234 TC: Channels or signals selected for insert editing V: Video A1234: Audio 1, 2, 3, 4 TC: Time code

When the SUB STATUS menu item is set to TC MODE:

On-screen indication	Meaning
INT PRST FREE [IP F]	The internal time code generator is operating in FREE RUN mode.
INT PRST REC [IP R]	The internal time code generator is operating in REC RUN mode.
INT REGEN-T&U [IRTU]	The internal time code generator is in synchronization with the playback time code (LTC) read from tape.
EXT LTC-T&U [ELTU]	The internal time code generator is in synchronization with the external time code (LTC) input to the unit and is generating the same time code value and user bit value as those of the external time code (regeneration).
EXT VITC-T&U [EVTU]	The internal time code generator is in synchronization with VITC present in the external video signal input to the unit and is generating the same time code value and user bit value as those of the external time code (regeneration).
EXT QSDI-T&U [EQTU]	The internal time code generator is in synchronization with the external time code input to the unit via the SDTI (QSDI) interface and is generating the same time code value and user bit value as those of the external time code (regeneration).
EXT QSDI. V-T&U [EQTU]	The internal time code generator is in synchronization with the external VITC input to the unit via the SDTI (QSDI) interface and is generating the same time code value and user bit value as those of the external time code (regeneration).
EXT DVIN-T&U [EDTU]	The internal time code generator is in synchronization with the external time code input to the unit via the i.LINK (DV IN) interface and is generating the same time code value and user bit value as those of the external time code (regeneration).
EXT DVIN. V-T&U [EDTU]	The internal time code generator is in synchronization with the external VITC input to the unit via the i.LINK (DV IN) interface and is generating the same time code value and user bit value as those of the external time code (regeneration).

When the SUB STATUS menu item is set to REMAIN:

On-screen indication	Meaning
REMAIN 184 min	Remaining capacity of the tape in minutes. When the remaining capacity has not been calculated, "REMAIN — min" appears.

When the SUB STATUS menu item is set to AUDIO MIXING:

On-screen indication	Meaning
1 2 3 4 [MIX]	Input audio channels selected for mixing 1 2 3 4: Input audio channels 1, 2, 3 and 4

Example display:

```
 12   2   3   34
```

- Input audio channels 3 and 4 are mixed and recorded on audio channel 4 on tape.
- Input audio channel 3 is recorded on audio channel 3 on tape.
- Input audio channel 2 is recorded on audio channel 2 on tape.
- Input audio channels 1 and 2 are mixed and recorded on audio channel 1 on tape.

Display format of supplementary status information when the SUB STATUS menu item is set to ALL

All items of supplementary status information are displayed in the order shown below.

```
T C R   0 0 : 0 4 : 4 7 : 0 7
        P L A Y        L O C K
  V 1 2 3 4 T   M I X   E D T U V
```

- Editing mode settings
- Operating mode of the internal time code generator (The rightmost "V" appears when the VITC menu item (see page 62) is set to ON.)
- Setting for input audio mixing
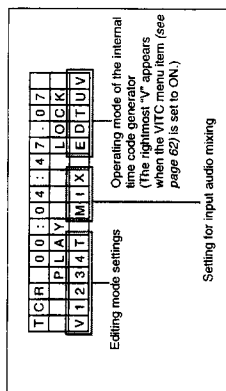
Connections and Settings | Chapter

Connections for a Digital Non-Linear Editing System

This unit can be connected to an ES-7 EditStation to configure a digital non-linear editing system.

If you use the SDTI (QSDI) interface with the optional DSBK-1501 board installed in the unit, you can transfer video, audio, time code, and other compressed data between this unit and the ES-7.

The unit supports ClipLink functions, enabling index pictures recorded on tape and ClipLink log data stored in cassette memory to be transferred to the ES-7 in an instant.

For a general description of ClipLink functions, see the appendix "ClipLink Guide" (page 105).

The following figure shows a connection diagram for a non-linear editing system in which this unit serves as the recorder.

For connections of the ES-7 and its peripheral devices such as the ESBK-7011 Control Panel, the ESBK-7045 Disk Unit, etc., refer to your ES-7 Operating Instructions.

Note
The DSR-1500/1500P unit shown in the following figure is fitted with the optional DSBK-1501, DSBK-1503, and DSBK-1504/1504P boards.
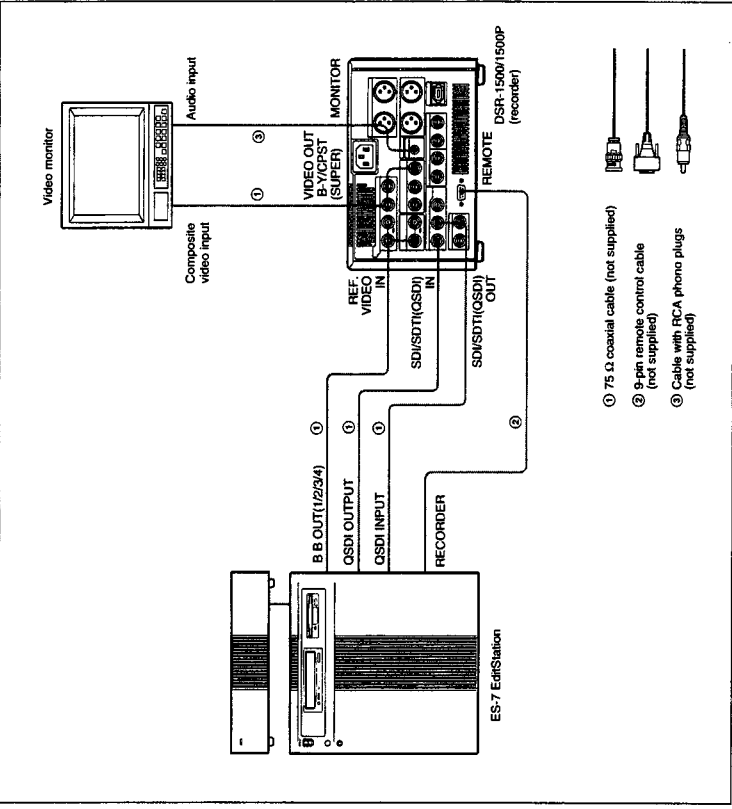
Connections for a Cut Editing System

The following figure shows a cut editing system configuration that includes two DSR-1500/1500P units to serve as the player and recorder.

For details of connecting devices other than the DSR-1500/1500P, refer to the instruction manual for each device.

Notes

- This application requires both of the DSR-1500/1500P units (recorder and player) to be fitted with the optional DSBK-1501 board.
- The DSR-1500/1500P units shown in the following figure are fitted with the optional DSBK-1501, DSBK-1503, and DSBK-1504/1504P boards.

When you select assemble or insert editing mode on the editing control unit, the two DSR-1500/1500P units (recorder and player) will automatically enter the selected editing mode.

① 75 Ω coaxial cable (not supplied)
② 9-pin remote control cable (not supplied)
③ Cable with RCA phono plugs (not supplied)

Audio input
MONITOR
Source monitor
Composite video input
VIDEO OUT B-Y/CPST (SUPER)
REMOTE
DSR-1500/1500P (player)

Audio input
Main monitor
MONITOR
Composite video input
VIDEO OUT B-Y/CPST (SUPER)
REMOTE
DSR-1500/1500P (recorder)

SDI/SDTI (QSDI) OUT
SDI/SDTI (QSDI) IN
VIDEO OUT Y/CPST
REF. VIDEO IN
RECORDER
PLAYER
Editing control unit (RM-450/450CE, PVE-500, etc.) a)

a) For the settings on the editing control unit, see "Settings on an editing control unit" on page 88.

Connections for a Digital Non-Linear Editing System

Video monitor
Audio input
MONITOR
VIDEO OUT B-Y/CPST (SUPER)
Composite video input
REF. VIDEO IN
SDI/SDTI(QSDI) IN
SDI/SDTI(QSDI) OUT
REMOTE
DSR-1500/1500P (recorder)

B B OUT(1/2/3/4)
QSDI OUTPUT
QSDI INPUT
RECORDER
ES-7 EditStation

① 75 Ω coaxial cable (not supplied)
② 9-pin remote control cable (not supplied)
③ Cable with RCA phono plugs (not supplied)

Settings on the DSR-1500/1500P

Switch/menu item	Setting
LOCAL/REMOTE switch	REMOTE (REMOTE indicator lights.)
DIGITAL OUTPUT menu item *(see page 67)*	SDTI (SDTI indicator lights.)
REMOTE I/F menu item *(see page 67)*	9PIN (9P indicator lights.)

For details of video/audio input and audio mode settings, see "Settings for Recording" on page 27.

Connections for an A/B Roll Editing System

The following is an example configuration of A/B roll editing system using the DSR-1500/1500P.

In this configuration, two DSR-1500/1500P units are used, one as the recorder and the other as player 1, and an analog Betacam UVW-1600/1600P Videocassette Player unit is used as player 2. To create a final tape (a tape that contains a completely packaged program) in Betacam format, use a Betacam VCR such as the UVW-1800/1800P as the recorder.

Notes

- This application requires the DSR-1500/1500P unit used as the recorder to be fitted with the optional DSBK-1504/1504P board.
- The DSR-1500/1500P units shown in the following figure are fitted with the optional DSBK-1501, DSBK-1503, and DSBK-1504/1504P boards.

The purpose of the following figure is to indicate the flow of signals among the component devices in the system. The specific connections and settings are described beginning on *page 85.*

Settings on the DSR-1500/1500Ps (recorder and player)

Switch/menu item	Setting
LOCAL/REMOTE switch	REMOTE (REMOTE indicator lights.)
DIGITAL OUTPUT menu item (see page 67)	SDT1 (for player only) (SDTI indicator lights.)
REMOTE I/F menu item (see page 67)	9PIN (9P indicator lights.)

For details of the video/audio input and audio mode settings for the recorder, see "Settings for Recording" on page 27.

About reference video signals

In order to provide stable video and audio signals for analog editing, it is necessary for the built-in time base corrector (TBC) to operate correctly. To ensure this, input a reference video signal synchronized with the video signal to the REF. VIDEO IN connector.

Reference video signal connection

When you perform recording, be sure to input a reference video signal.

For details of reference video signals, see "About reference video signals" on page 82.

DFS-500/500P DME Switcher

DSR-1500/1500P (recorder)

DSR-1500/1500P (player 1)

UVW-1600/1600P (player 2)

PVE-500 Editing Control Unit

BLACK BURST OUT

REF. VIDEO IN

REF. VIDEO IN

REF. VIDEO IN 75 Ω termination switch: ON

REF. VIDEO IN 75 Ω termination switch: ON

REF. VIDEO IN

REF. VIDEO IN

Use 75 Ω coaxial cables for all of these connections.

Audio monitor system connections

The following shows an example of audio monitor system connections.

For details of these connections, refer to the instruction manual for each connected device.

Speaker (right channel)

Speaker (left channel)

Audio amplifier

Cables with RCA phono plugs

MONITOR OUT 1

MONITOR OUT 2

MXP-290 Audio Mixer

Audio system monitor

DPS-D7 or other delay unit a)

MXP-290 Audio Mixer

UVW-1600/1600P (player 2)

Source video monitor

DSR-1500/1500P (recorder)

PVE-500, etc. (editing control unit)

DSR-1500/1500P (player 1)

Main video monitor

Video signal generator (Sony Tektronix TSG-130, etc.)

DFS-500/500P DME Switcher

Video signal

Audio signal

Reference video signal

Control signal

a) When using a DFS-500/500P DME Switcher, the phase of the video signals processed by the DFS-500/500P is delayed. It is therefore necessary to connect a delay unit between the MXP-290 Audio Mixer's output and the audio input to the DSR-1500/1500P (recorder).

Video/audio signal connections

The following shows an example of video/audio signal connections in an A/B roll editing system.

In this example, analog component signals are used as the video signals and XLR 3-pin connectors are used as audio input/output connectors.

DFS-500/500P DME Switcher

VIDEO INPUTS COMPONENT 2
VIDEO INPUTS COMPONENT 1
PGM OUT COMPONENT 1

DSR-1500/1500P (player 1)
VIDEO OUT
AUDIO OUT 1/3 2/4

COMPONENT 1 OUTPUT
UVW-1600/1600P (player 2)
AUDIO OUTPUT CH-1 CH-2

DSR-1500/1500P (recorder)
VIDEO IN
AUDIO IN 2/4 1/3

DFS-D7 or other delay unit
CH-1 OUT CH-2 OUT
CH-1 IN CH-2 IN
LINE OUT 1 LINE OUT 2

MXP-290 Audio Mixer
MIC/LINE IN 1 2 3 4

① 12-pin/3-BNC cross cable (not supplied; consult your Sony dealer about this cable.)

② 12-pin dubbing cable (not supplied)

③ Cable with XLR connections (not supplied)

Settings on the DSR-1500/1500P (recorder)

Switch/menu item	Setting
LOCAL/REMOTE switch	LOCAL
CH1 IN LEVEL and CH2 IN LEVEL menu items (see page 66)	Normally +4 dBm

For details of the video/audio input and audio mode settings, see "Settings for Recording" on page 27.

Settings on the DSR-1500/1500P (player)

Switch/menu item	Setting
LOCAL/REMOTE switch	LOCAL
OUTPUT LEVEL menu item (see page 66)	Normally +4 dBm
VIDEO OUTPUT menu item (see page 66)	Y-R, B (Y-R,B indicator lights.)
AUDIO OUTPUT menu item (see page 67)	1/2 CH or 3/4 CH (CH 1/2 or CH 3/4 indicator lights.)

Connections for an A/B Roll Editing System

Control signal connections

The following shows an example of control signal connections to enable the editing control unit to control all other A/B roll editing system devices.

DSR-1500/1500P (recorder)
REMOTE

DSR-1500/1500P (player 1)
REMOTE

UVW-1600/1600P (player 2)
REMOTE

DFS-500/500P DME Switcher
EDITOR

MXP-290 Audio Mixer
EDITOR (15-pin)

PVE-500 Editing Control Unit
RECORDER
PLAYER 1
PLAYER 2
MIXER SWITCHER

Mixer control mode selection switch: PARALLEL

9-pin remote control cable a)

9-pin/15-pin mixer control cable (not supplied)

a) For the 9-pin remote control cable, use an optional RCC-5G/10G/30G cable.

1-44

DSR-1500/1500P

Connection of a video monitor

Set up the following connections to enable monitoring of video and audio signals on a video monitor. In addition to the video and audio signals, you can have time data, the operation mode of the unit, alarm messages, and other information displayed as text on the monitor screen by setting the CHARA. DISPLAY menu item (see page 60) to ON (factory default setting).

75 Ω termination switch: ON (or attach a 75 Ω terminator)
Input switches: Set according to the type of input signals.

① Cable with RCA phono plugs (not supplied)
② 75 Ω coaxial cable (not supplied)
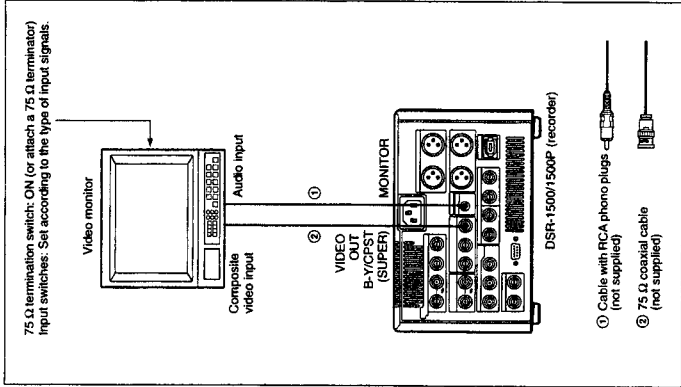
Settings on an editing control unit

When connecting an editing control unit, make the settings as follows, according to the model.

PVE-500
No settings are required.

BVE-600/900/910/2000 (NTSC model) or FXE-100/120
Set the VCR constants as follows.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
80	17	00	96	05	05	03	80	0A	08	FE	00	80	5A	FF

BVE-600/900/910/2000 (PAL model) or FXE-100P/120P
Set the VCR constants as follows.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
81	17	00	7D	05	05	02	80	0A	07	FE	00	80	4C	FF

RM-450/RM-450CE
Set the DIP switches as follows.

• Left switches

7	6	5	4	3	2	1	0
OFF	-	-	OFF	-	-	-	-

• Right switches (RM-450)

7	6	5	4	3	2	1	0
OFF	-	OFF	ON	OFF	OFF	ON	ON

• Right switches (RM-450CE)

7	6	5	4	3	2	1	0
ON	-	OFF	ON	OFF	OFF	ON	ON

BVE-800
Set the DIP switches as follows.

• SW2

1	2	3	4	5	6	7	8
ON	OFF	ON	ON	-	ON	ON	-

• SW3 (NTSC model)

1	2	3	4	5	6	7	8
ON	ON	ON	OFF	-	ON	OFF	OFF

• SW3 (PAL model)

1	2	3	4	5	6	7	8
OFF	OFF	OFF	ON	-	ON	OFF	OFF

Connections for SDTI (QSDI) Dubbing

The following shows an example of connections for digitally dubbing SDTI (QSDI) signals (see page 51) using a pair of DSR-1500/1500P units.

Notes
- This application requires both of the DSR-1500/1500P units (recorder and player) to be fitted with the optional DSBK-1501 board.
- The DSR-1500/1500P units shown in the following figure are fitted with the optional DSBK-1501, DSBK-1503, and DSBK-1504/1504P boards.

① 75 Ω coaxial cable (not supplied)
② 9-pin remote control cable (not supplied)
③ Cable with RCA phono plugs (not supplied)
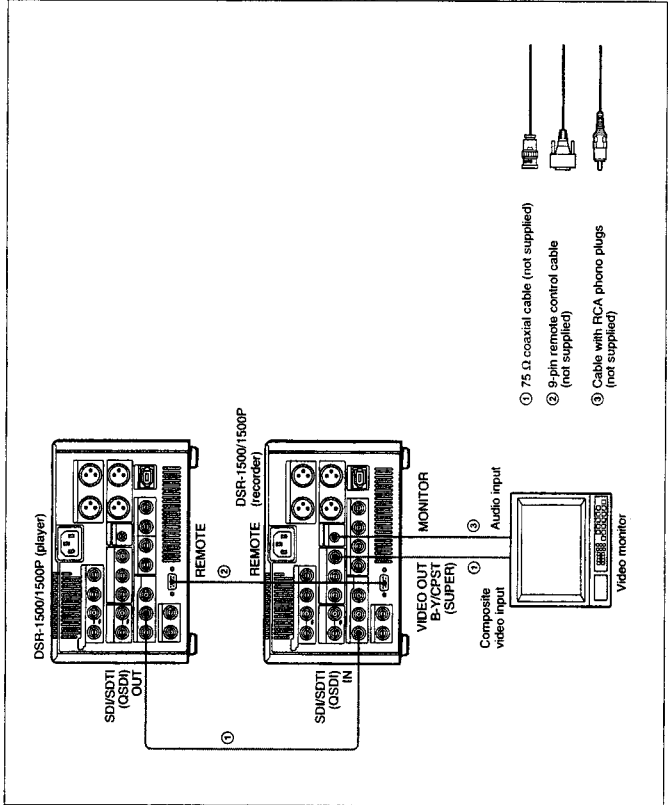
Settings on the DSR-1500/1500P (recorder)

Switch/menu item	Setting
LOCAL/REMOTE switch	LOCAL

Settings on the DSR-1500/1500P (player)

Switch/menu item	Setting
LOCAL/REMOTE switch	REMOTE (REMOTE indicator lights.)
DIGITAL OUTPUT menu item (see page 67)	SDTI (SDTI indicator lights.)
REMOTE I/F menu item (see page 67)	9PIN (9P indicator lights.)

Displaying the digital hours meter

Use the following procedure.

1 Press the MENU button in the menu control section.

The menu selection level display appears on the monitor screen and in the time counter display.

Menu selection level display

SYSTEM MENU
AUTO FUNCTION
HOURS METER

Monitor screen

Setup menu
Time counter display
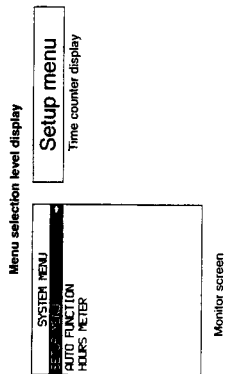
2 Press the ∇ button to select "HOURS METER."

SETUP MENU
AUTO FUNCTION

Monitor screen

Hours meter
Time counter display
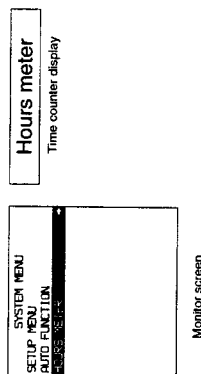
3 Press the ▷ button.

The cumulative counts by the digital hours meter are indicated on the monitor screen and in the time counter display.

Digital hours meter indications on the monitor screen

All four counts (T1, T2, T3, and CT) are indicated on the monitor screen.

Resettable trip counts
Unresettable counts

HOURS METER
T1 [0000] [00000] X10 HOURS
T2 [0000] [00000] X10 HOURS
T3 [0000] [00000] X10 HOURS
CT [0000] [00000] X10 COUNT

T1:OPERATION
T2:DRUM ROTATION
T3:TAPE RUNNING
CT:THREADING
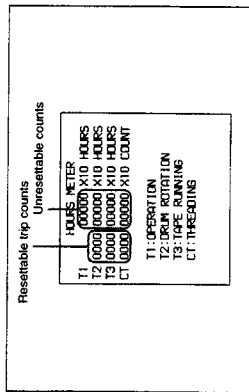
The four-digit value to the left of the slash (/) is the resettable trip count, and the right value is the cumulative total from manufacture.

Digital hours meter indications in the time counter display

One of the four indications appears in the time counter display at a time. Use the △ and ∇ buttons in the menu control section to change the item displayed. Initially, only the trip value appears. Hold down the △ button to display also the cumulative total from manufacture, which will appear to the right of the trip value and the slash (/).
The following illustrates the digital hours meter indications in the time counter display in all four display modes. The right-hand indication for each display mode is the indication you can view while holding down the ▷ button in the menu control section.

T1 (OPERATION) mode:

Oper. 00000

T2 (DRUM ROTATION) mode:

Drum 0000   0000/00000

T3 (TAPE RUNNING) mode:

Tape 0000   0000/00000

CT (THREADING) mode:

Thread 0000   0000/00000

To end the digital hours meter display

Press the MENU button in the menu control section.

To reset the trip values

About this operation, consult your Sony dealer.

Head Cleaning

Always use the DVM12CL (mini size) or DV12CL (standard size) Cleaning Cassette to clean the video and audio heads. You can run the cleaning cassette for 10 seconds per cleaning operation. Follow the instructions for the cleaning cassette, as inappropriate use of the cleaning cassette can damage the heads.

To clean the heads

Insert the cleaning cassette. This automatically starts cleaning. You cannot operate any tape transport control buttons other than the EJECT button during the cleaning operation.
After about 10 seconds, the cleaning cassette will be automatically ejected.

Troubleshooting

If an alarm message appears on the monitor screen, or if the unit appears to be malfunctioning, please check the following before contacting your Sony dealer.

Tape problems

Symptom	Cause	Remedy
Recording is not possible.	The cassette's REC/SAVE switch is set to SAVE.	Set the REC/SAVE switch to REC, or use another cassette.
The unit's tape transport control buttons (PLAY, F FWD, REW, etc.) do not work.	The REMOTE indicator in the display section is lit and the LOCAL ENABLE menu item is set to ALL DISABLE.	Set the LOCAL/REMOTE switch to LOCAL to turn the REMOTE indicator off, or change the setting of the LOCAL ENABLE menu item (see page 59) to ALL ENABLE.
	No cassette is loaded.	Insert a cassette (see page 25).
The NO EDIT indicator on the front panel lights up.	The audio recording mode selected on this unit does not coincide with that of the loaded tape.	• When your current purpose is editing, set the LOCAL/REMOTE switch to LOCAL to turn the REMOTE indicator off and set the unit for the same audio recording mode as with the tape using the REC MODE menu item (see page 65), then set the switch to REMOTE to light the REMOTE indicator again. • When your current purpose is recording, you can use the tape currently loaded in the unit.
	The recording format of the currently loaded tape is "DV" or "DVCPRO."	Replace the tape with one recorded in the DVCAM format.

Time data problems

Symptom	Cause	Remedy
Cannot freely set the initial time data value.	The TC MODE menu item is set to EXT REGEN.	Change the setting of the TC MODE menu item (see page 62) to INT PRESET.
	CNT is selected as the time data type to be displayed (the COUNTER time data type indicator is lit).	Press the COUNTER SELECT button to make the TC or U-BIT time data type indicator light up (the CNT value cannot be set freely).
	The REMOTE indicator in the display section is lit and the LOCAL ENABLE menu item is set to STOP & EJECT or ALL DISABLE.	Set the LOCAL/REMOTE switch to LOCAL to turn the REMOTE indicator off or change the setting of the LOCAL ENABLE menu item (see page 59) to ALL ENABLE.
The tape is running, but the time data is not shown in the time counter display.	The MENU button or TC PRESET button in the menu control section has been pressed.	Press the button once again to exit the menu control mode, time code preset mode, or digital hours meter display mode. (In either of the menu control mode and time code preset mode, the time data is not shown in the time counter display.)
	The U-BIT time data type indicator is lit.	Press the COUNTER SELECT button to make the COUNTER or TC time data type indicator light up.

Input problem

Symptom	Cause	Remedy
It is not possible to record an SDTI (QSDI) signal.	No SDTI signal is input to the unit, or the SDTI format has not been selected.	Connect an SDTI signal to the SDI/SDTI (QSDI) IN connector, or set the DIGITAL OUTPUT menu item (see page 67) to SDTI.

Monitor problems

Symptom	Cause	Remedy
Data is not superimposed on the monitor screen.	The CHARA. DISPLAY menu item is set to OFF.	Set the CHARA. DISPLAY menu item (see page 60) to ON.
	The monitor is not connected to the B–Y/CPST (SUPER) connector of this unit.	Connect the monitor to the B–Y/CPST (SUPER) connector. (You must make this connection to display any type of text on the monitor.)
The image on the monitor screen is too bright.	The 75 Ω termination switch for video input on the monitor is in the OFF position, or a 75 Ω terminator is not fitted to its video input connector.	Set the 75 Ω termination switch to ON or connect a terminator.
The image on the monitor screen is too dark.	In a video signal loop-through connection of video monitors, 75 Ω termination switches for video input on monitors other than the loop-end monitor are in the ON position.	Set the 75 Ω termination switches to OFF on all monitors other than the loop-end monitor.
The image is too dark when recording a composite video signal.		

Audio problem

Symptom	Cause	Remedy
The REC/PB LEVEL control knobs do not work.	The VAR switch on the front panel is set to PRESET.	Set the VAR switch to REC when recording, or set it to PB when playing back.

Editing restriction

Symptom	Cause
Execution of video editing in insert mode erases subcode data (user bit data, etc.) recorded on tape other than time code data.	This phenomenon cannot be avoided with an editing system using this unit as the recorder.

Error Messages

This unit is provided with a self-diagnostic function that detects internal abnormalities. When it detects an abnormality, it outputs an error message to the monitor screen and indicates an error code in the time counter display.

Note

To display error messages on the monitor screen, connect the monitor to the B-Y/CPST (SUPER) connector, and set the CHARA. DISPLAY menu item (see page 60) to ON (factory default setting).

```
ERROR
AN ERROR HAS BEEN
DETECTED. INFORM SERVICE
OF FOLLOWING CODE:
02-603 ···· Error message
              Error code
PRESS EJECT KEY ···· Direction    Error code
TO EJECT TAPE.
```
Monitor screen

Error02-603

Direction   Time counter display
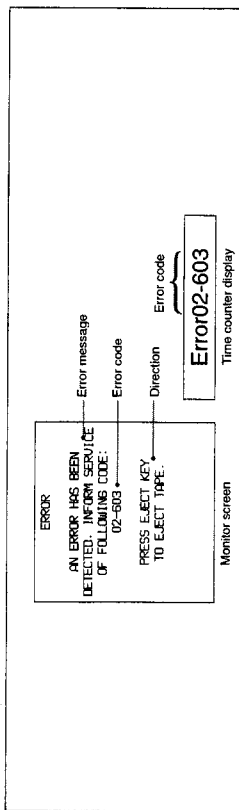
If an error message appears, follow the direction indicated on the monitor screen.

Alarm Messages

When operating this unit, the unit may sometimes output alarm messages such as the one shown below to the monitor screen and the time counter display.

```
ALARM
REMOTE MODE IS SELECTED. ···· Cause of alarm
SET REMOTE/LOCAL SWITCH ···· Direction
TO LOCAL.
```
Monitor screen

REMOTE!

Time counter display
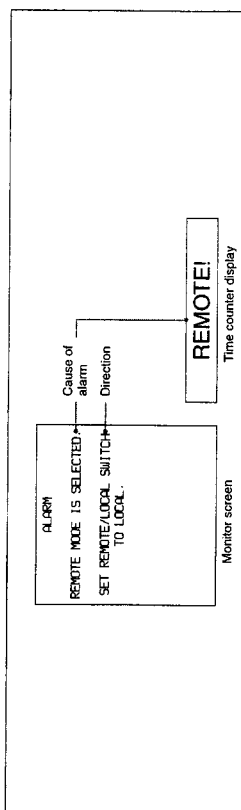
If such an alarm message appears, a connection or operation error may have been made, or condensation on heads may have occurred. Follow the direction indicated on the monitor screen.

Note

To display alarm messages on the monitor screen, it is necessary for the monitor to be connected to the B-Y/CPST (SUPER) connector, and set the following menu items to ON.
• CHARA. DISPLAY (see page 60)
• ALARM (see page 61)
• REF ALARM (see page 61)

Alarm messages and associated directions

Alarm message on monitor screen (Cause)	Direction	Alarm message in time counter display
A cleaning tape has been inserted.	The tape will automatically be ejected after cleaning is completed.	Cleaning Tp!
A non-standard signal is being used for input video.	Use a standard signal.	VIN NON-STD
A non-standard ref. signal is being used for REF. VIDEO.	Use a standard signal.	REF NON-STD
Abnormal settings selected in setup menu.	Correct the setup menu settings. Contact your Sony dealer if this alarm message appears again after making corrections.	ILL. SETUP!
Audio mixing mode cannot be changed during recording.	—	REC mode!
Audio not editable on this tape.	Use a tape recorded in 2-channel/48 kHz or 4-channel/32 kHz mode.	2CH/32kHz! / Fs 44.1kHz!
	Use a tape having audio signals recorded in locked mode.	UNLOCK mode
Audio REC mode selection different from audio on tape.	Select the same audio recording mode as that of the tape.	A mode err
Audio REC (recording) mode cannot be changed during recording.	—	REC mode!
Cassette adaptor not usable.	Use a tape without cassette adaptor.	Adaptor!
Counter mode is selected.	Use the COUNTER SELECT button to light the TC or U-BIT time data type indicator in the display section.	CNT mode!
Input selection cannot be changed in REC (recording) mode.	—	REC mode!
Input signal does not conform to DVCAM/DV format.	—	Unknown Sig
Input signal is 625/50. (For DSR-1500)	—	625/50 sig! (For DSR-1500)
Input signal is 525/60. (For DSR-1500P)	—	525/60 sig! (For DSR-1500P)
Input video is not detected.	Check the VIDEO indicator in the INPUT signal display section and supply an appropriate video signal.	No INPUT!
Input video signal does not synchronize with REF. VIDEO signal.	Use a reference video signal.	ILL. REF!
Moisture has been detected.	Keep the power on and wait until this alarm message disappears.	HUMID!
No cassette in VTR.	Load a cassette.	No Cass.!
Rec inhibit mode is selected.	Set the REC INHIBIT menu item (see page 59) to OFF.	REC INH.!
Record inhibit plug on the cassette is set to inhibit.	Set the REC/SAVE switch on the cassette to REC.	REC INH.!
Remote mode is selected.	Set the LOCAL/REMOTE switch to LOCAL.	REMOTE!
Tape cannot be replayed.	Use a tape recorded in 525/60 format. (For DSR-1500)	625/50 Tape (For DSR-1500)
	Use a tape recorded in 625/50 format. (For DSR-1500P)	525/60 Tape (For DSR-1500P)
Tape end has been detected.	Use a new cleaning tape.	Tape end!

Alarm messages and associated directions

Alarm message on monitor screen (Cause)	Direction	Alarm message in time counter display
Tape not editable.	Use a tape recorded in DVCAM format.	Not DVCAM!
	Use a tape recorded in 525/60 format. (For DSR-1500)	625/50 Tape (For DSR-1500)
	Use a tape recorded in 625/50 format. (For DSR-1500P)	525/60 Tape (For DSR-1500P)
Tape not recordable.	Use a DVCAM/DV ME tape.	REC INHI.!
Tape not usable.	Use a DVCAM/DV/DVCPRO (25 Mbps) tape.	ILL. Tape!
TC EXTERNAL is selected.	Set the TC MODE menu item (see page 62) to INT PRESET.	TC EXT!
TCG REGEN mode is selected.	Set the TC MODE menu item (see page 62) to INT PRESET.	REGEN mode!
TCG RUN mode is set to REC RUN.	Set the RUN MODE menu item (see page 62) to FREE RUN.	REC RUN!

Appendixes

Precautions

On safety

- Should any liquid or solid object fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it further.
- Unplug the unit from the wall outlet if it is not to be used for an extended period of time.
- To disconnect the cord, pull it out by the plug. Never pull the cord itself.

On operation and storage locations

Avoid operation or storage in any of the following places.

- Location subject to extremes of temperature (operating temperature range 5°C to 40°C (41°F to 104°F))
- Location subject to direct sunlight for long periods, or close to heating appliances (Note that the interior of a car left in summer with the windows closed can exceed 50°C (122°F).)
- Damp or dusty places
- Location subject to severe vibrations
- Location near equipment generating strong electromagnetic emissions
- Location near transmitting stations generating strong radio waves

Operate the unit in a horizontal position

This unit is designed to be operated in a horizontal position. Do not operate it on its side, or tilted through an excessive angle (exceeding 20°).

Avoid violent impacts

Dropping the unit, or otherwise imparting a violent shock to it, is likely to cause it to malfunction.

Do not obstruct ventilation openings

To prevent the unit from overheating, do not obstruct ventilation openings, by for example wrapping the unit in a cloth while it is in operation.

On cleaning

If the casing or panel is dirty, wipe it gently with a soft dry cloth. In the event of extreme dirt, use a cloth steeped in a neutral detergent to remove the dirt, then wipe with a dry cloth. Applying alcohol, thinners, insecticides, or other volatile solvents may result in deforming the casing or damaging the finish.

On repacking and shipping

Save the original shipping carton and packing material; they will come in handy if you ever have to ship your unit. For maximum protection, repack your unit as it was originally packed at the factory, and take care not to impart violent shocks in transit.

Specifications

General

Signal system DSR-1500: NTSC
DSR-1500P: PAL

Power requirements
100 V to 240 V AC, 50/60 Hz

Power consumption (with all options installed)
65 W

Peak inrush current
(1)Power ON, current probe method:
30 A (100 V), 30 A (240 V)
(2)Hot switching inrush current,
measured in accordance with
European standard EN55103-1:
20 A (230 V)

Operating temperature
5°C to 40°C (41°F to 104°F)

Storage temperature
−20°C to +60°C (−4°F to +140°F)

Operating relative humidity
Less than 80%

Storage relative humidity
Less than 90%

Mass 6.0 kg (13 lb 3 oz)

External dimensions (w/h/d)
211 × 137 × 420 mm
(8 3/8 × 5 1/2 × 16 5/8 inches)

420(16 5/8)

137(5 1/2)

211(8 3/8)

Unit: mm (inches)
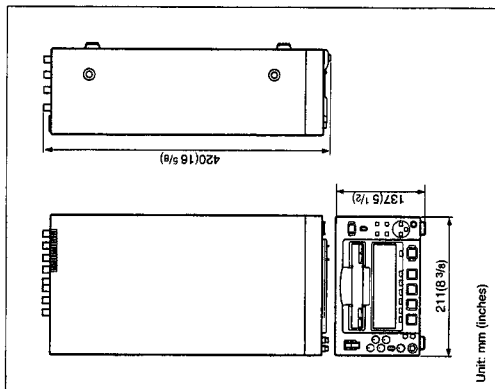
Tape transport control system

Tape speed DSR-1500: 28.193 mm/s
DSR-1500P: 28.221 mm/s

Recording/playback time
Using PDV-184ME standard-size
cassette:
Maximum 184 minutes
Using PDVM-40ME mini-size cassette:
Maximum 40 minutes

Fast forward/rewind time
Using PDV-184ME standard-size
cassette:
Less than 3 minutes
Using PDVM-40ME mini-size cassette:
Less than 1 minute

Search speed When controlling via RS-422A interface:
Maximum 60 times normal speed in
both directions
When controlling from DSRM-10
Remote Control Unit:
Jog mode: 0 (still) to 2 times normal
speed in both directions
Shuttle mode: 8 speeds from 0 (still) to
16 times normal speed in both
directions

Video performance

Band width Composite/S-video (DSR-1500):
30 Hz to 4.2 MHz ±1.0 dB (Y)
Composite/S-video (DSR-1500P):
25 Hz to 4.8 MHz ±1.0 dB (Y)
Component (DSR-1500):
30 Hz to 5.0 MHz ±1.0 dB (Y),
30 Hz to 1.5 MHz +1.0/−5.0 dB (R−Y/
B−Y)
Component (DSR-1500P):
25 Hz to 5.0 MHz ±1.0 dB (Y),
25 Hz to 2.0 MHz +1.0/−2.0 dB (R−Y/
B−Y)

S/N Composite/S-video I/O (Y):
52 dB or more
Component I/O (Y): 55 dB or more

Y/C delay 30 ns or less

K-factor 2.0% or less (K2T, KPB)

Processor adjustment range

Video level* ±3 dB/−∞ to 3 dB selectable
Chrome level* ±3 dB/−∞ to 3 dB selectable
Setup/Black level*
±30 IRE (±210 mV)
Chroma phase* ±30°
System phase** Sync: ±1 μs
SC: ±180°

* Adjust with menu settings.
** Adjust with controls on the front panel.

Audio performance

Frequency response
Two-channel (48 kHz) mode:
20 Hz to 20 kHz ±1.0 dB
Four-channel (32 kHz) mode:
20 Hz to 14.5 kHz ±1.0 dB
Dynamic range More than 87 dB
Distortion (THD + N)
Less than 0.07% (48 kHz)

Input connectors

Digital signal inputs

SDI/SDTI (QSDI) IN (optional DSBK-1501 Digital Input/
Output Board required)
BNC type
SDTI (QSDI) format (270 Mbps)
SDI format (270 Mbps), SMPTE 259M/
CCIR656-III

AUDIO (AES/EBU) IN (optional DSBK-1501 Digital
Input/Output Board required)
BNC type (×2), complying with AES-
3id-1995

DV IN/OUT (optional DSBK-1503 i.LINK/DV Input/
Output Board required)
6-pin IEEE 1394 connector

Analog video inputs

REF. VIDEO IN
BNC type (×2, loop-through with 75 Ω
automatic terminator)
Black burst
0.286 V (DSR-1500) or 0.3 V (DSR-
1500P), 75 Ω, negative sync
Composite sync

VIDEO IN (optional DSBK-1504/1504P Analog Input
Board required)
BNC type (×3 and 1 loop-through
connector with 75 Ω automatic
terminator), composite/component/S-
video switchable

Composite Y/CPST and 1 loop-through connector
with 75 Ω automatic terminator: 1.0
Vp-p, 75 Ω, sync negative

Component Y/CPST: 1.0 Vp-p, 75 Ω, negative sync
R−Y/C and B−Y: 0.7 Vp-p (75% color
bars for DSR-1500 or 100% color bars
for DSR-1500P), 75 Ω

S-video Y/CPST: 1.0 Vp-p, 75 Ω, negative sync
R−Y/C: 0.286 Vp-p (DSR-1500) or 0.3
Vp-p (DSR-1500P), 75 Ω (burst level)

Analog audio inputs

AUDIO IN (optional DSBK-1504/1504P Analog Input
Board required)
XLR 3-pin, female (×2), +4/0/−3*/−6
dBm, high impedance, balanced

* For DSR-1500P only

Time code input

TC IN BNC type, SMPTE time code (DSR-
1500) or EBU time code (DSR-
1500P), 0.5 Vp-p to 18 Vp-p, 3.3 kΩ,
unbalanced

Output connectors

Digital signal outputs
SDI/SDTI (QSDI) OUT (optional DSBK-1501 Digital
Input/Output Board required)
BNC type (x2)
SDTI (QSDI) format (270 Mbps)
SDI format (270 Mbps), SMPTE 259M/
CCIR656-III
AUDIO (AES/EBU) OUT (optional DSBK-1501 Digital
Input/Output Board required)
BNC type (x2), complying with AES-
3id-1995
DV IN/OUT (optional DSBK-1503 i.LINK/DV Input/
Output Board required)
6-pin IEEE 1394 connector

Analog video outputs
VIDEO OUT   BNC type (x3), composite/component/
S-video switchable
Composite   Y/CPST, R–Y/C/CPST, and B–Y/CPST
(SUPER): 1.0 Vp-p, 75 Ω, sync
negative
Component   Y/CPST: 1.0 Vp-p, 75 Ω, negative sync
R–Y/C/CPST and B–Y/CPST (SUPER):
0.7 Vp-p (75% color bars for DSR-
1500) or 100% color bars for DSR-
1500P), 75 Ω
S-video   Y/CPST: 1.0 Vp-p, 75 Ω, negative sync
R–Y/C/CPST: 0.286 Vp-p (DSR-1500)
or 0.3 Vp-p (DSR-1500P), 75 Ω (burst
level)

Analog audio outputs
AUDIO OUT   XLR 3-pin, male (x2), +4/0/–3*/–6 dBm,
600 Ω loading, low impedance,
balanced
MONITOR   Phono jack, –∞ to –11 dBu ±1 dBu, 47
kΩ, unbalanced
* For DSR-1500P only

Output for headphones
HEADPHONES   Stereo phone jack, –∞ to –13 dBu, 8 Ω,
unbalanced

Time code output
TC OUT   BNC type, SMPTE time code (DSR-
1500), EBU time code (DSR-1500P),
2.2 Vp-p ±3 dB, 600 Ω, unbalanced

Remote control connectors

REMOTE   D-sub 9-pin, for connection of editing
control unit*, RS-422A standard
CONTROL S   Stereo minijack, for connection of
SIRCS-compatible remote control unit
(DSRM-10)
DV IN/OUT (optional DSBK-1503 i.LINK/DV Input/
Output Board required)
6-pin IEEE 1394 connector
* ES-7, PVE-500, RM-450/450CE, BVE-600/800/910/2000/9100/9100P,
etc.

Supplied accessories

AC power cord (1)
Operating Instructions (1)

Optional accessories

DSBK-1501 Digital Input/Output Board
DSBK-1503 i.LINK/DV Input/Output Board
DSBK-1504/1504P Analog Input Board
RCC-5G/10G/30G 9-pin remote control cable (length: 5 m
(16 ft)/10 m (33 ft)/30 m (98 ft))
Digital video cassette
Standard size: PDVM-64ME/94ME/
124ME/184ME
Mini size: PDVM-12ME/22ME/32ME/
40ME
Cleaning cassette
DV12CL (standard size), DVM12CL
(mini size)

Related equipment

ES-3/7 EditStation
Linear editing control unit: PVE-500, RM-450/450CE,
BVE-600/800/910/2000/9100/9100P
DME switcher: DFS-300/300P, DFS-500/500P,
DFS-700/700P
DXC-D30/D30P Color Video Camera
DSR-1/1P/300A Digital Videocassette Recorder
DSR-85/85P/70/70P/80/80P/1800/1800P/2000/2000P
Digital Videocassette Recorder
DSR-1600/1600P Digital Videocassette Player
DSR-300/300P/500WS/500WSP/130/130P/150/150P
Digital Camcorder
DSRM-10 Remote Control Unit

Design and specifications are subject to change without
notice.

ClipLink Guide

What Is ClipLink?

The ClipLink function greatly improves the efficiency of
the video production process as a whole by recording
various editing-related data on tape when shooting. As
such, ClipLink is a revolutionary function that transcends
the conventional separation of shooting and editing.

How ClipLink Changes Video Production Techniques

The following describes various ways in which ClipLink*
video production differs from conventional video
production.

* The ClipLink system is a video production system which uses the cassette
memory function.

Recording of ClipLink log data lightens the shooting workload

When you start shooting a scene, ClipLink log data such as
the scene number and time code data are automatically
recorded into the cassette memory. This eliminates the
need for a conventional "shot list" compiled by someone
using a stopwatch, clipboard and pencil. You can also
designate unwanted scenes as "NG" (no good) and
automatically skip all "NG" scenes when editing.

Recorded index pictures drastically cut editing time

The ClipLink function also features index pictures as a
time-saving tool for rough editing. Each index picture is a
compressed image taken from the start of each scene,
which is recorded onto the tape as a still picture. When
editing, begin by transferring only the index pictures and
the ClipLink log data to the EditStation's hard disk. You
can also transfer OK scenes only ("NG" scenes are
skipped).
Next, begin rough editing by viewing the index pictures on
the EditStation's GUI display and rearranging them as you
wish. This eliminates the difficult work of matching up a
handwritten shot list with recorded scenes. After you have
completed this rough editing, you can then transfer only
the recordings needed for your video program.

High-speed transfer of recordings

It is also possible to transfer the editing material itself
between the DSR-85/85P and ES-7 at four times normal
speed. In other words, the transfer can be carried out in one
fourth of the real time duration. It is of course possible to
carry out a transfer at four times normal speed when
backing up video and audio data recorded on the disk drive
to the DSR-85/85P, or in the opposite direction when
loading data backed up on the DSR-85/85P to the disk
drive. Thus the time required is much shorter than with
conventional equipment (for which, for example,
transferring a 40-minute segment of video takes 40
minutes).

ClipLink log data

ClipLink log data can be recorded automatically or manually into the cassette memory for use as a convenient alternative to the conventional "shot list."

ClipLink log data includes the following items.

ClipLink log data	Description
Reel number (cassette number)	Data (maximum length: 8 digits) consisting of alphanumeric characters and/or symbols (This is left blank at shipping.)
Scene number	A three-digit number from 001 to 198 (starts at 001 and is automatically incremented with each scene.)
Take number	This cannot be changed (set to "1" at shipping).
OK/NG	Indicates the OK/NG status of a particular scene. (In the OK case, nothing is recorded.)
Mark IN/OUT point time codes	These are the time codes that indicate the Mark IN and Mark OUT points for each scene (HH:MM:SS). These time codes are recorded when the camera has been set to MARK mode. The time code value is rounded up at each Mark IN point and rounded down at each Mark OUT point, to a whole number of seconds. *For details, see "Time codes recorded for Mark IN/OUT points" on page 109.*
Cue point time code	This is the time code that indicates the cue points (valid up to the frame digit). This time code is recorded when the camera has been set to CUE mode. When in this mode, the time codes at the start and end of a recording (the Rec IN and Rec OUT time codes) are automatically recorded as Mark IN and OUT points, respectively.

Data Generated When Shooting

The following describes the kinds of data that is generated when using the ClipLink function.

Index pictures

When shooting, a single-frame image from the Mark IN point at the start of each scene is recorded as a still picture into the camcorder's internal memory. These images are called "index pictures." When you finish shooting, the index pictures from all scenes are recorded onto the tape after the last scene.

Up to 32 index pictures can be recorded onto the tape space normally occupied by one frame, as shown below.

Seven frame spaces are reserved at the end of the last scene as a recording area for index pictures. (A cassette with 16 Kbits of cassette memory can record up to 198 index pictures, and a cassette with 4 Kbits of cassette memory can record up to 45 index pictures.)

Example System Configuration and Operation Flow

The following illustration shows an example system configuration for using the ClipLink function and a typical ClipLink operation flow.

a) The DSR-1600/1600P is a videocassette player.
b) To transfer SDTI signals between the DSR-85/1500/1500P or DSR-1800/1800P and ES-7, installation of the DSBK-1501 Digital Input/Output Board on the DSR-1500/1500P or the DSBK-1802 SDTI (QSDI) Input/Output Board on the DSR-1800/1800P is required; to send an SDTI signal from the DSR-1600/1600P to the ES-7, installation of the DSBK-1602 SDTI (QSDI) Output Board on the DSR-1600/1600P is required.
c) Between the DSR-85/85P and ES-7, quadruple transfer is possible through the SDTI interface.

Time codes recorded for Mark IN/OUT points

There is a gap between actual time codes and Mark IN/OUT time codes recorded in the cassette memory, as shown in the figure below. The time code value is rounded up at each Mark IN point and rounded down at each Mark OUT point, to a whole number of seconds.

Actual time code

Mark IN (or Rec IN) 12:23:15:10 — Rounded up
Cue 12:34:20:20
Mark OUT (or Rec OUT) 12:39:24:23 — Rounded down

Time code recorded in the cassette memory

12:23:16 (The index picture is the image around 12:23:15:10.)
12:34:20:20
12:39:24

Recording capacity for Mark IN/OUT point time codes and cue point time codes

When in MARK mode, up to 198 pairs of Mark IN and Mark OUT points can be recorded (if using a cassette with 16 Kbits of cassette memory).

When in CUE mode, up to 396 time code points (including all cue point time codes and all Mark (Rec) IN and Mark (Rec) OUT point time codes) can be recorded (if using a cassette with 16 Kbits of cassette memory).

How to record ClipLink log data

The following describes how to record the various ClipLink log data items.

OK/NG status

To designate a scene as "NG," press the NG button on the camera while shooting the scene or at any time before you begin shooting the next scene.

All scenes that do not receive an "NG" designation are recorded as "OK" scenes.

(When you exit the VCR recording mode, changing the OK/NG status is no longer possible.)

Mark IN/OUT point time codes

This data is especially useful when shooting a video program for which a scenario has been created.

Set the camera to MARK mode before you start shooting. While shooting, each time you press the camera's TAKE button, Mark IN and Mark OUT point time codes are recorded alternately.

Start recording — Index picture 1 — Index picture 2 — End recording
Mark IN (manual recording)
Mark OUT (manual recording)
Mark IN (manual recording)
Mark OUT (manual recording)
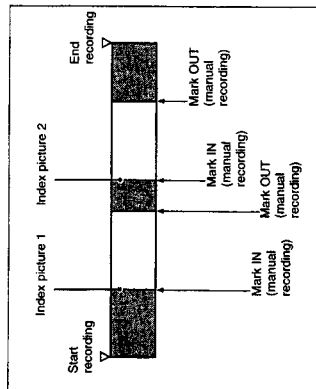
Cue point time codes

This type of data is especially useful when shooting scenes that may contain unexpected events, such as when shooting for sports coverage or documentaries.

Set the camera to CUE mode before you start shooting.

While shooting, each time you press the camera's TAKE button, the current time code is recorded as a cue point time code.

Start recording — Index picture 1 — End recording
Rec IN (automatic recording)
Cue point time code (manual recording)
Cue point time code (manual recording)
Cue point time code (manual recording)
Rec OUT (automatic recording)

Glossary

A/B roll editing
An editing method that uses two or more playback VCRs to create special effects such as dissolve and wipe, and uses one record VCR to record the results of the editing. Using an editing control unit allows efficient control of the VCRs and very precise editing.

AES/EBU format
A unified format for digital audio signals. It allows a single connector to carry the signals for two channels.

B–Y signal
A chrominance signal determined by subtracting the Y (luminance) signal from the B (blue) signal. One of the component signals.

Capstan
A drive mechanism that moves the tape at a specified speed. Its rotation normally synchronizes with a reference sync signal.

Chrominance signal
Color signal containing color information such as hue and saturation. Also called C signal.

Component signals (YRB)
A video signal consisting of a luminance signal (Y) and two chrominance signals (R–Y, B–Y).

Composite signal
A composite video signal containing video, burst and sync signals.

Condensation
Condensation of moisture on the tape transport mechanisms of VCRs including the head drum. If moisture condenses on the head drum, the tape adheres to the drum and causes malfunction.

Drop frame mode
Time code runs at 30 frames/sec. The NTSC system, however, runs at about 29.97 frames/sec. Drop frame mode adjusts this difference. The time code and video are synchronized by dropping the first two frames of the time code every minute, except at the ten-minute marks.

EE mode
EE is an abbreviation of "Electric to Electric". Video and audio signals are supplied to the VCR's internal circuits, but not to the recording heads.

Head drum
A metal cylinder to which a video head is attached. This drum is rotated at high speeds in synchronization with the sync signal during recording and playback.

Linear editing
Editing while playing back video and audio signals recorded on video tape. See also "Non-linear editing."

Loading
When being loaded, the tape is pulled out of the cassette case and threaded along the specified tape path and wrapped round the drum to be ready for recording or playback. Generally, this is done automatically when you place the cassette at the cassette entrance of the VCR. Also called threading.

Loop-through connection
A connection which allows a signal input to an input connector to pass through the unit and exit from an output connector as input to external equipment. Also called bridging connection.

Luminance signal
The signal that determines the brightness of the picture. Also called Y signal. One of the component signals.

Non-drop frame mode
The number of frames of the time code and video run is not adjusted. When you use the time code in non-drop frame mode, the real playback time will be about 86 seconds shorter per day than the time code. If you edit frame by frame or if you determine the length of a shot by counting the time code, use drop frame mode.

Non-linear editing
Editing while playing back video and audio signals recorded on hard disks. Video scenes stored on disk can be cued up quickly, for increased editing efficiency. See also "Linear editing."

PCM audio
This is an audio signal represented by pulse code modulation. The analog audio signal is first broken down into a sequence of pulses, and these are then represented digitally.

Preroll
Running of a video tape to a prior to an edit-start point to enable the tape to reach a steady speed and to be synchronized with other video tapes.

R–Y signal
A chrominance signal determined by subtracting the Y (luminance) signal from the R (red) signal. One of the component signals.

Reference video signal
A video signal consisting of a sync signal or sync and burst signals, used as a reference.

Setup (for DSR-1500)
The difference between the reference black level and the blanking level of a composite signal.

SMPTE
Abbreviation of Society of Motion Picture and Television Engineers, a professional association established in the USA.

S/N
Abbreviation of Signal-to-Noise (ratio). The higher the S/N value, the less noise and higher the picture quality.

Search mode
A VCR operating mode used when searching for specific scenes, by viewing the video output or time code values while playing back the tape at various speeds in forward or reverse direction.

Servo lock
Synchronizing the drum rotation phase and tape transport phase with a reference signal during playback and recording so that the video heads scan the tape in the same pattern during playback and recording.

Standby Off mode
One of two conditions in the stop mode. The drum does not rotate and tape is slackened. There is no damage to the video heads and the tape, but the VCR is not ready for immediate recording or playback.

Standby On mode
One of two conditions in the stop mode. The drum is rotating and the tape is wrapped round the drum. The VCR is ready for recording or playback, so a still picture can be obtained.

Subcarrier
A sine wave imposed on the luminance portion of a video signal and modulated to carry color information. Its amplitude represents color saturation and its phase represents hue.

Superimpose
To put a set of characters onto a picture so that both can be seen at the same time.

S-video
A signal format in which Y (luminance) and C (chrominance) signals are separated to reduce interference between them so that noiseless images are reproduced.

Sync signal
A reference signal consisting of vertical and horizontal sync signals used for synchronizing the scanning patterns of the video camera and the monitor.

TBC
Abbreviation of Time Base Corrector. Electronic circuits to electrically stabilize the playback signals by removing color variation and roll in the playback picture caused by irregularity in drum rotation and tape movement. Time base correction reduces deterioration of picture quality when transmitting or copying playback signals.

Threading
See "Loading."

Time code
Signals recorded on the tape to supply information on tape position such as the hour, minute, second and frame, to assist in setting edit points or searching for particular scenes.

Unloading
When the EJECT button is pressed, the VCR automatically winds the tape back into the cassette case. Also called "Unthreading."

User bits
Sections of time code information consisting of a total of 32 bits that can be used for recording information such as date, tape ID number, program ID number, etc.

SONY®

Digital Input/Output Board

Installation Instructions

DVCAM™

DSBK-1501

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The DSBK-1501 Digital Input/Output Board is an optional board for the DSR-1500/1500P Digital Videocassette Recorder.

The DSBK-1501 optional board is provided with three fastening screws (M3 × 6).

Refer to the DSR-1500/1500P Operating Instructions for information on connecting and operating the DSR-1500/1500P fitted with the DSBK-1501.

For the customers in the USA

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For the customers in Canada

This Class A digital apparatus complies with Canadian ICES-003.

For the customers in Europe

This product with the CE marking complies with the EMC Directive (89/336/EEC) issued by the Commission of the European Community.
Compliance with this directive implies conformity to the following European standards:
• EN55103-1: Electromagnetic Interference (Emission)
• EN55103-2: Electromagnetic Susceptibility (Immunity)
This product is intended for use in the following Electromagnetic Environment(s):
E1 (residential), E2 (commercial and light industrial), E3 (urban outdoors) and E4 (controlled EMC environment, ex. TV studio).

Pour les utilisateurs au Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Pour les clients européens

Ce produit portant la marque CE est conforme à la Directive sur la compatibilité électromagnétique (EMC) (89/336/CEE) émise par la Commission de la Communauté européenne. La conformité à cette directive implique la conformité aux normes européennes suivantes:
• EN55103-1: Interférences électromagnétiques (émission)
• EN55103-2: Sensibilité électromagnétique (immunité)
Ce produit est prévu pour être utilisé dans les environnements électromagnétiques suivants:
E1 (résidentiel), E2 (commercial et industrie légère), E3 (urbain extérieur) et E4 (environnement EMC contrôlé ex. studio de télévision).

Für Kunden in Europa

Dieses Produkt besitzt die CE-Kennzeichnung und erfüllt die EMV-Direktive (89/336/EEC) der EG-Kommission.
Die Erfüllung dieser Direktive bedeutet Konformität für die folgenden Europäischen Normen:
• EN55103-1: Elektromagnetische Interferenz (Emission)
• EN55103-2: Elektromagnetische Empfindlichkeit (Immunität)
Dieses Produkt ist für den Einsatz unter folgenden elektromagnetischen Bedingungen ausgelegt:
E1 (Wohnbereich), E2 (kommerzieller und in beschränktem Maße industrieller Bereich), E3 (Stadtbereich im Freien) und E4 (kontrollierter EMV-Bereich, z.B. Fernsehstudio).

Per i clienti in Europa

Questo prodotto recante il marchio CE è conforme alla direttiva sulla compatibilità elettromagnetica (EMC) (89/336/CEE) emessa dalla Commissione della Comunità Europea. La conformità a questa direttiva implica la conformità alle seguenti normative europee:
• EN55103-1: Interferenza elettromagnetica (Emissione)
• EN55103-2: Sensibilità ai disturbi elettromagnetici (Immunità)
Questo prodotto è destinato all'uso nei seguenti ambienti elettromagnetici:
E1 (residenziali), E2 (commerciali e industriali leggeri), E3 (esterni urbani) e E4 (ambienti EMC controllati, ad esempio studi televisivi).

Caution

If this option is installed incorrectly, personal injury or damage to peripheral items may occur due to fire, shock, or other accidental circumstances. To avoid such risks, installation should be performed by qualified service personnel.

1

Remove the blanking panel (b) and the rear panel (a).

2


Pull out the lower board (SSS-10).

3

Pull out the second board (DVP-19) from the bottom.

4

Plug the connectors on the DSBK-1501 board into the connectors on the edge of the board (DVP-19) you have just pulled out, then fasten the DSBK-1501 board with the screws.

If the DSBK-1503 board and i.DV IN/OUT connector are already installed, remove the i.DV IN/OUT connector from the connector adapter, and refit to the i.DV IN/OUT connector section (c) of the DSBK-1501 board.

5
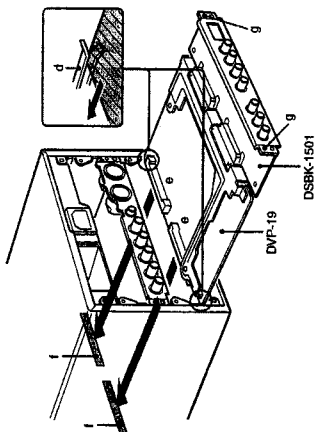
Insert the DVP-19 board and DSBK-1501 board, aligning them with the guides (d), and plug the connectors (e) of the DVP-19 board into the connectors (f) on the DSR-1500/1500P unit.
At this point, align the positioning holes (g) with the studs at the edge of the unit.

6
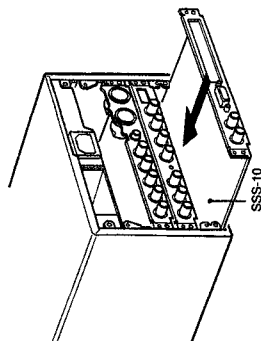
Replace the lower board (SSS-10).

7

Replace the rear panel. Fasten the screw (h).

SONY

i.LINK/DV Input/ Output Board

Installation Instructions

DVCAM™ **i**

DSBK-1503

For the customers in the USA

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For the customers in Canada

This Class A digital apparatus complies with Canadian ICES-003.

For the customers in Europe

This product with the CE marking complies with the EMC Directive (89/336/EEC) issued by the Commission of the European Community.
Compliance with this directive implies conformity to the following European standards:
• EN55103-1: Electromagnetic Interference (Emission)
• EN55103-2: Electromagnetic Susceptibility (Immunity)
This product is intended for use in the following Electromagnetic Environment(s):
E1 (residential), E2 (commercial and light industrial), E3 (urban outdoors) and E4 (controlled EMC environment, ex. TV studio).

**Pour les utilisateurs au Canada**

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Pour les clients européens

Ce produit portant la marque CE est conforme à la Directive sur la compatibilité électromagnétique (EMC) (89/336/CEE) émise par la Commission de la Communauté européenne.
La conformité à cette directive implique la conformité aux normes européennes suivantes:
• EN55103-1: Interférences électromagnétiques (émission)
• EN55103-2: Sensibilité électromagnétique (immunité)
Ce produit est prévu pour être utilisé dans les environnements électromagnétiques suivants:
E1 (résidentiel), E2 (commercial et industrie légère), E3 (urban extérieur) et E4 (environnement EMC contrôlé ex. studio de télévision).

Für Kunden in Europa

Dieses Produkt besitzt die CE-Kennzeichnung und erfüllt die EMV-Direktive (89/336/EEC) der EG-Kommission.
Die Erfüllung dieser Direktive bedeutet Konformität für die folgenden Europäischen Normen:
• EN55103-1: Elektromagnetische Interferenz (Emission)
• EN55103-2: Elektromagnetische Empfindlichkeit (Immunität)
Dieses Produkt ist für den Einsatz unter folgenden elektromagnetischen Bedingungen ausgelegt:
E1 (Wohnbereich), E2 (kommerzieller und in beschränktem Maße industrieller Bereich), E3 (Stadtbereich im Freien) und E4 (kontrollierter EMV-Bereich, z.B. Fernsehstudio).

Per i clienti in Europa

Questo prodotto recante il marchio CE è conforme alla direttiva sulla compatibilità elettromagnetica (EMC) (89/336/CEE) emessa dalla Commissione della Comunità Europea.
La conformità a questa direttiva implica la conformità alle seguenti normative europee:
• EN55103-1: Interferenza elettromagnetica (Emissione)
• EN55103-2: Sensibilità ai disturbi elettromagnetici (Immunità)
Questo prodotto è destinato all'uso nei seguenti ambienti elettromagnetici:
E1 (residenziali), E2 (commerciali e industriali leggeri), E3 (esterni urbani) e E4 (ambienti EMC controllati, ad esempio studi televisivi).

Overview

The DSBK-1503 i.LINK*/DV Input/Output Board is an optional board for the DSR-1500/1500P Digital Videocassette Recorder.
Refer to the DSR-1500/1500P Operating Instructions for information on connecting and operating the DSR-1500/1500P fitted with the DSBK-1503.

* i.LINK and ∎ are trademarks and indicate that this product is in agreement with IEEE1394-1995 specifications and their revisions.

The DSBK-1503 consists of the following items.
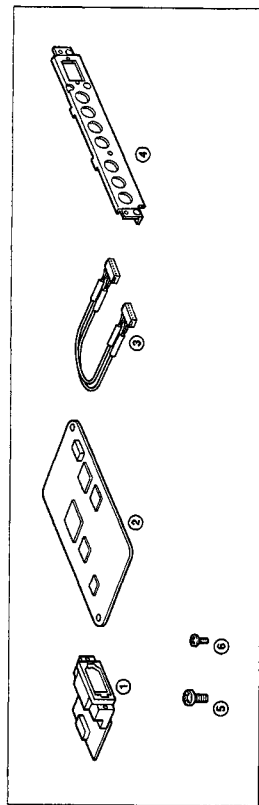
① i.DV IN/OUT connector
② DV-25 board
③ Harness
④ Connector adapter
⑤ Screws ((M3 × 6) × 3)
⑥ Screws ((M2 × 5) × 2)

Installation

1   Remove the blanking panel (b) and the rear panel (a).

2   Pull out the lower board (SSS-10).

3

Pull out the second board (DVP-19) from the
bottom.

4
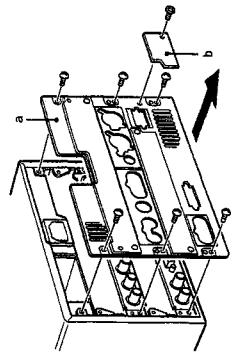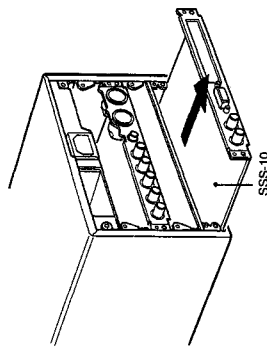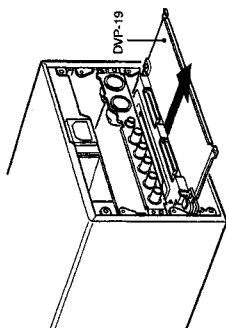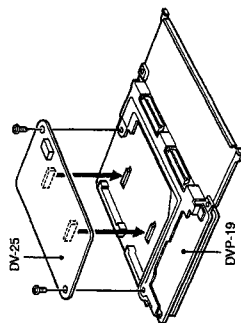
Plug the connectors on the underside of the DV-25
board into the connectors on the top of the board
(DVP-19) you pulled out in step **3**, and fasten the
DV-25 board with screws.

5
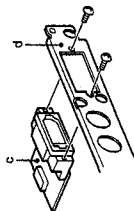
Fasten the i.DV IN/OUT connector (c) to the
supplied connector adapter (d) with screws.

6
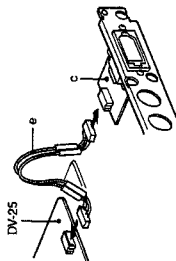
With the supplied harness (e), connect the i.DV IN/
OUT connector (c) to the DV-25 board.

7
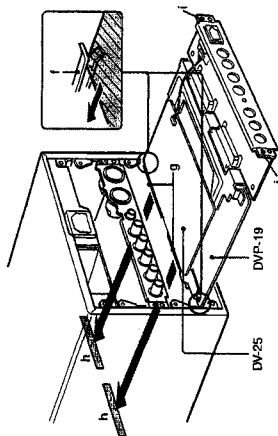
Insert the DVP-19 board and DV-25 board, aligning them with the guides (f), and plug the connectors (g) on the DVP-19 board into the connectors (h) on the DSR-1500/1500P unit.
At this point, align the positioning holes (i) with the studs at the edge of the unit.

8
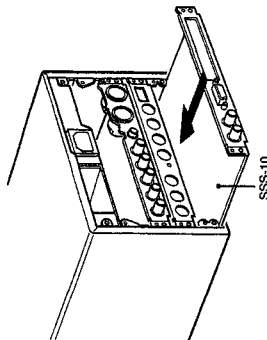
Replace the lower board (SSS-10).

9
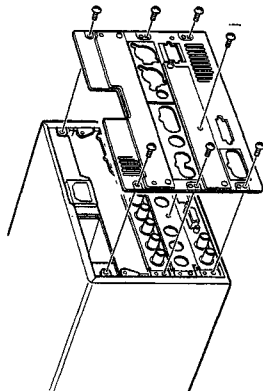
Replace the rear panel. Fasten the screw (j).

If the DSBK-1501 board is already installed

In the foregoing procedure, modify step **5** as follows.

5 Fit the i.DV IN/OUT connector to the i.DV IN/OUT connector section of the DSBK-1501 board.

SONY.

Analog Input Board

Installation Instructions

For the customers in the USA (for DSBK-1504 only)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For the customers in Canada (for DSBK-1504 only)

This Class A digital apparatus complies with Canadian ICES-003.

For the customers in Europe (for DSBK-1504P only)

This product with the CE marking complies with the EMC Directive (89/336/EEC) issued by the Commission of the European Community. Compliance with this directive implies conformity to the following European standards:
• EN55103-1: Electromagnetic Interference (Emission)
• EN55103-2: Electromagnetic Susceptibility (Immunity)
This product is intended for use in the following Electromagnetic Environment(s):
E1 (residential), E2 (commercial and light industrial), E3 (urban outdoors) and E4 (controlled EMC environment, ex. TV studio).

Pour les utilisateurs au Canada (pour DSBK-1504 seulement)

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Pour les clients européens (pour DSBK-1504P seulement)

Ce produit portant la marque CE est conforme à la Directive sur la compatibilité électromagnétique (EMC) (89/336/CEE) émise par la Commission de la Communauté européenne.
La conformité à cette directive implique la conformité aux normes européennes suivantes:
• EN55103-1: Interférences électromagnétiques (émission)
• EN55103-2: Sensibilité électromagnétique (immunité)
Ce produit est prévu pour être utilisé dans les environnements électromagnétiques suivants:
E1 (résidentiel), E2 (commercial et industrie légère), E3 (urbain extérieur) et E4 (environnement EMC contrôlé ex. studio de télévision).

Für Kunden in Europa (nur für DSBK-1504P)

Dieses Produkt besitzt die CE-Kennzeichnung und erfüllt die EMV-Direktive (89/336/EEC) der EG-Kommission.
Die Erfüllung dieser Direktive bedeutet Konformität für die folgenden Europäischen Normen:
• EN55103-1: Elektromagnetische Interferenz (Emission)
• EN55103-2: Elektromagnetische Empfindlichkeit (Immunität)
Dieses Produkt ist für den Einsatz unter folgenden elektromagnetischen Bedingungen ausgelegt:
E1 (Wohnbereich), E2 (kommerzieller und in beschränktem Maße industrieller Bereich), E3 (Stadtbereich im Freien) und E4 (kontrollierter EMV-Bereich, z.B. Fernsehstudio).

Per i clienti in Europa (soltanto per la DSBK-1504P)

Questo prodotto recante il marchio CE è conforme alla direttiva sulla compatibilità elettromagnetica (EMC) (89/336/CEE) emessa dalla Commissione della Comunità Europea.
La conformità a questa direttiva implica la conformità alle seguenti normative europee:
• EN55103-1: Interferenza elettromagnetica (Emissione)
• EN55103-2: Sensibilità ai disturbi elettromagnetici (Immunità)
Questo prodotto è destinato all'uso nei seguenti ambienti elettromagnetici:
E1 (residenziali), E2 (commerciali e industriali leggeri), E3 (esterni urbani) e E4 (ambienti EMC controllati, ad esempio studi televisivi).

Overview

The DSBK-1504/1504P Analog Input Board is an optional board for the DSR-1500/1500P Digital Videocassette Recorder.
The DSBK-1504/1504P optional board is provided with a fastening screw (M3 × 6).
Refer to the DSR-1500/1500P Operating Instructions for information on connecting and operating the DSR-1500/1500P fitted with the DSBK-1504/1504P.

DVCAM™

DSBK-1504/1504P

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Installation

If this option is installed incorrectly, personal injury or damage to peripheral items may occur due to fire, shock, or other accidental circumstances. To avoid such risks, installation should be performed by qualified service personnel.

1 Remove the blanking panel (b) and the rear panel (a).

2 Insert the DSBK-1504/1504P board, aligning it with the guides (c), and plug the connector (d) on the DSBK-1504/1504P board into the connector (e) on the DSR-1500/1500P unit.
   At this point, align the positioning holes (f) with the studs at the edge of the unit.

3 Replace the rear panel. Fasten the screw (g).

DSBK-1504/1504P
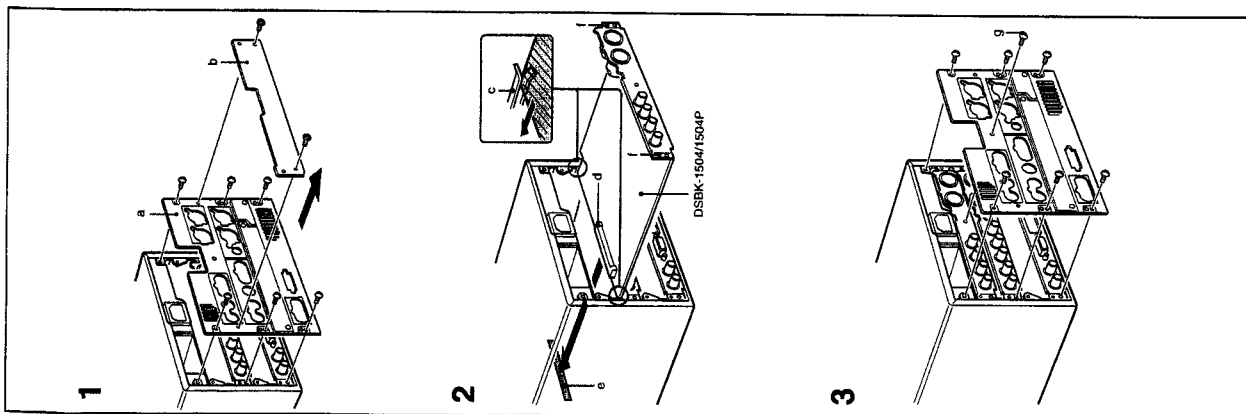
Section 2
Installation

Be sure to install the DSR-1500/1500P in location satisfying the required operational environment described below to assure the DSR-1500/1500P superior performance and to maintain the excellent serviceability and accessibility.

2-1. Operational Environment

- Operating temperature :   +5 °C to +40 °C
- Humidity :   80 % or less
- Storage temperature :   −20 °C to +60 °C
- Locations to avoid :
  - Areas where the unit will be exposed to direct sunlight or any other strong lights.
  - Dusty areas or areas where it is subject to vibration.
  - Areas with strong electric or magnetic fields.
  - High-temperature environment.
    (Good air circulation is essential to prevent internal heat build-up. Place the unit in location with sufficient air circulation. Do not block the ventilation holes on the sides of the cabinet and the rear panel.)
- Horizontal condition :   within ±30 °

2-2. Operating Voltage

- Power voltage :   AC 100 V to 240 V
- Power frequency :   50/60 Hz
- Power consumption :   65 W

2-3. Supplied Accessories

- AC power cord :   1
- Operating instructions :   1

2-4. Optional Accessories

- Digital input/output board :   DSBK-1501
- i.LINK/DV input/output board :   DSBK-1503
- Analog input board :   DSBK-1504/1504P
- 9-pin remote cable :   RCC-5G/10G/30G
- Cleaning cassette tape :   DV12CL (Standard size), DVM12CL (Mini size)
- DVCAM video cassette (Mini size) :   PDVM-12ME/22ME/32ME/40ME
- DVCAM video cassette (Standard size) :   PDV-64ME/94ME/124ME/184ME

2-5. Matching Connectors

2-5-1. Matching Connectors/Cables

When external cables are connected to the connector on a connector panel during maintenance, the following connectors, cables (or their equivalents) must be used.

Connectors on DSR-1500/1500P Side	Matching connector/cable		
Panel indication	Designation	Sony Part No.	Remark

ANALOG IN
  REF. VIDEO IN
  TIME CODE IN
	BNC, MALE	1-560-069-11	When DSBK-1504/
			1504P is attached

AUDIO IN CH-1/3, 2/4	XLR 3P, FEMALE	1-508-083-11	When DSBK-1504/ 1504P is attached

ANALOG OUT
  TIME CODE OUT
  VIDEO OUT
  COMPONENT VIDEO OUT
	BNC, MALE	1-560-069-11	

MONITOR AUDIO	PIN PLUG	Standard Product	
AUDIO OUT CH-1/3, 2/4	XLR 3P, MALE	1-508-084-11	
i.LINK	IEEE1394 6P (1 m) IEEE1394 6P (3.5 m)	1-782-408-21 1-791-184-11	When DSBK-1503 is attached
SDI/SDTI (QSDI) INPUT	BNC, MALE	1-560-069-11	When DSBK-1501 is attached
SDI/SDTI (QSDI) OUTPUT	BNC, MALE	1-560-069-11	When DSBK-1501 is attached
DIGITAL AUDIO (AES/EBU) INPUT CH-1/2, CH-3/4	BNC, MALE	1-560-069-11	When DSBK-1501 is attached
OUTPUT CH-1/2, CH-3/4	BNC, MALE	1-560-069-11	When DSBK-1501 is attached
REMOTE-IN	D-SUB 9P, MALE	1-560-651-11	

2-5-2. Input/Output Signals of the Connectors

INPUT

REF.VIDEO :
BNC × 2 (loop-through : with 75 Ω automatic termination switch)
NTSC black burst, 0.286 V p-p, 75 Ω,
sync negative : when the composite video signal is input (The BB signal can be input.)
PAL black burst, 0.3 Vp-p , 75 Ω sync negative

COMPONENT VIDEO :
BNC × 3 (when the DSBK-1504/1504P is attached)
Luminance : 1.0 V p-p, 75 Ω, sync negative,
loop-through : with 75 Ω automatic termination switch
R-Y/C : 0.7 V p-p, 75 Ω (75 %), in case of NTSC S-C : 0.286 V p-p (burst level),
0.7 V p-p, 75 Ω (100 %), in case of PAL S-C : 0.3 V p-p (burst level)
B-Y : 0.7 V p-p, 75 Ω (75 %), in case of NTSC
0.7 V p-p, 75 Ω (100 %), in case of PAL

SDI/SDTI (QSDI) INPUT :
BNC × 1 (when the DSBK-1501 is attached)
SDI : Serial digital interface format (270 Mbps),
SMPTE 259M (NTSC)/ITU-R BT.656 (PAL)
SDTI (QSDI) : Serial digital interface unit
(DVCAM compressed signal : video + audio + TC signal)

AUDIO IN :
XLR 3P × 2 (when the DSBK-1504/1504P is attached)
Reference level switchable (−6/0/+4 dBu), high impedance, balanced

DIGITAL AUDIO (AES/EBU) :
BNC × 2 (when the DSBK-1501 is attached)
conformed with AES-3id-1995

TIME CODE :
BNC × 1
SMPTE (NTSC)/EBU (PAL)
0.5 to 18 V p-p, 3 kΩ, unbalanced

i.LINK :
IEEE1394 connector 6P × 1 (when the DSBK-1503 is attached)

OUTPUT

COMPONENT VIDEO :
BNC × 3
Luminance : 1.0 V p-p, 75 Ω, sync negative,
loop-through : with 75 Ω automatic termination switch
R-Y/C : 0.7 V p-p, 75 Ω (75 %), in case of NTSC S-C : 0.286 V p-p (burst level),
0.7 V p-p, 75 Ω (100 %), in case of PAL S-C : 0.3 V p-p (burst level)
B-Y : 0.7 V p-p, 75 Ω (75 %), in case of NTSC
0.7 V p-p, 75 Ω (100 %), in case of PAL

SDI/SDTI (QSDI) OUTPUT :
BNC × 2 (when the DSBK-1501 is attached)
SDI : Serial digital interface format (270 Mbps),
SMPTE 259M (NTSC)/ITU-R BT.656 (PAL)
SDTI (QSDI) : Serial digital interface unit
(DVCAM compressed signal : video + audio + TC signal)

AUDIO OUT :
XLR 3P × 2, MALE
+4 dBu, 600 Ω load, balanced (low impedance)

MONITOR AUDIO :
Pin jack × 1
−∞ to −11 dBu (NTSC : −20 dBFS),
−∞ to −9 dBu (PAL : −18 dBFS)
47 kΩ load, unbalanced , Headphone Volume : Center

DIGITAL AUDIO :
BNC × 2 (when the DSBK-1501 is attached)
conformed with AES-3id-1995

TIME CODE :
BNC × 1
SMPTE (NTSC)/EBU (PAL)
2.2 V p-p ±3.0 dB, 600 Ω, unbalanced

i.LINK :
IEEE1394 connector 6P × 1 (when the DSBK-1503 is attached)

REMOTE (D-sub 9-pin : MALE)
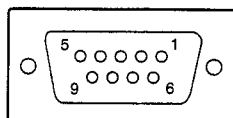
– EXT VIEW –

Pin No.	Controlling Device	Controlled Device
1	FRAME GROUND	FRAME GROUND
2	RECEIVE A	TRANSMIT A
3	TRANSMIT B	RECEIVE B
4	TRANSMIT COMMON	RECEIVE COMMON
5	PRIORITY IN	PRIORITY OUT
6	RECEIVE COMMON	TRANSMIT COMMON
7	RECEIVE B	TRANSMIT B
8	TRANSMIT A	RECEIVE A
9	FRAME GROUND	FRAME GROUND

2-6. Installation Setup and Adjustment

2-6-1. Front Panel Setting

Front panel

1. VIDEO INPUT select switch setting
   COMPOSITE : Ordinary video signal
   SG : Built-in video signal
   S VIDEO : Y/C separation type S video signal
   Y-R, B : Component signal (Betacam)
   SDI : Component digital signal
   SDTI/i.LINK : DV compressed digital signal

2. AUDIO INPUT SELECT switch setting
   ANALOG/DIGITAL (AES/EBU)/SDI/SG (built-in audio signal)

3. AUDIO REC/PB VAR switch
   PRESET : Sets both the REC and PB levels to the normal level.
   REC : Sets the REC audio level of the channels respectively with the CH-1/2/3/4 knobs.
   PB : Sets the PB audio level of the channels respectively with the CH-1/2/3/4 knobs.

SUB control panel

4. SYNC : Adjusts the sync phase of the output signal.
5. SC : Adjusts the phase of the subcarrier.

Layout of knobs and buttons on the front panel

3. AUDIO REC/PB VAR switch 5. SC 4. SYNC
1. VIDEO INPUT SELECT switch
2. AUDIO INPUT SELECT switch

①	MB-909	Motherboard
②	RP-117	RF REC/PB, ATF Detection
③	CN-2103 (DSBK-1503)	DV/i.Link Connector Board
④	DDE-15/15P (DSBK-1504)	Audio/Video Analog Input Board
⑤	AVP-3/3P	Audio/Video Analog Output Board
⑥	DVP-19	Video/Audio Digital Process
⑦	SSS-10	Super Syscon/Servo
⑧	FU-78AP	Video Process (PB)
⑨	FU-78AR	Video Process (REC)
⑩	DV-25 (DSBK-1503)	DV/i.LINK Input/Output Board
⑪	SDI-58 (DSBK-1501)	Digital Input/Output Board

DSR-1500/1500P
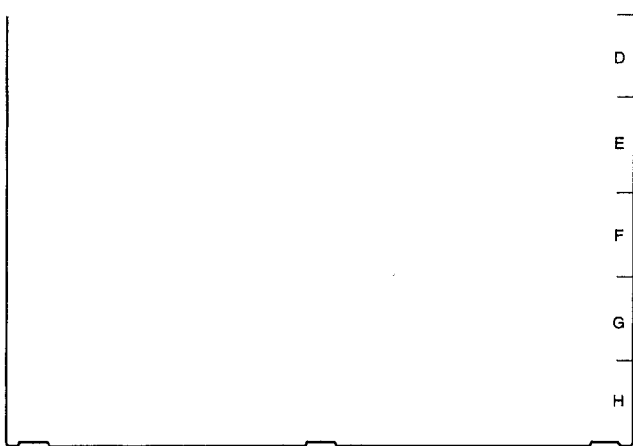
A side (component side)

Ref No.	Description	Factory Setting
S400	Sets the THRU OUT side of CN1 to REF or COMPOSITE (SUPER).	REF THRU
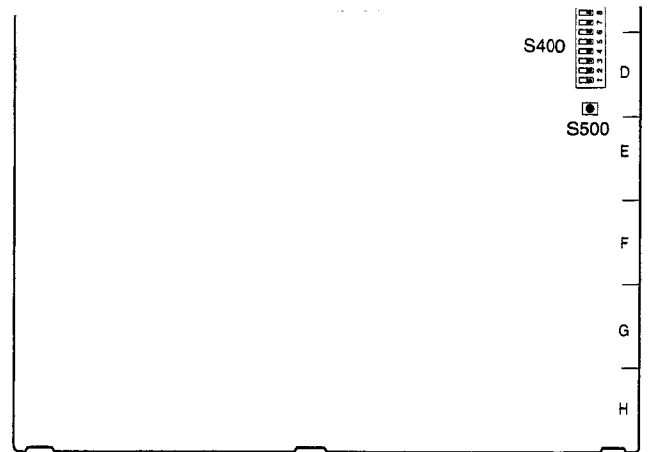
A side (component side)

Note

Do not change the setting of switches when the "factory use" is shown in the description.

Ref No.	Description			Factory Setting
S400-1	factory use			OFF
S400-2	factory use			OFF
S400-3	factory use			OFF
S400-4	factory use			OFF
S400-5	factory use			OFF
S400-6	factory use			OFF
S400-7, 8	Sets the destination			–
	Destination	bit-7	bit-8	
	UC	OFF	OFF	
	J	ON	OFF	
	CE	OFF	ON	
S500	Push this switch when resetting the system control.			–

DDE-15/15P board (DSBK-1504/1504P)
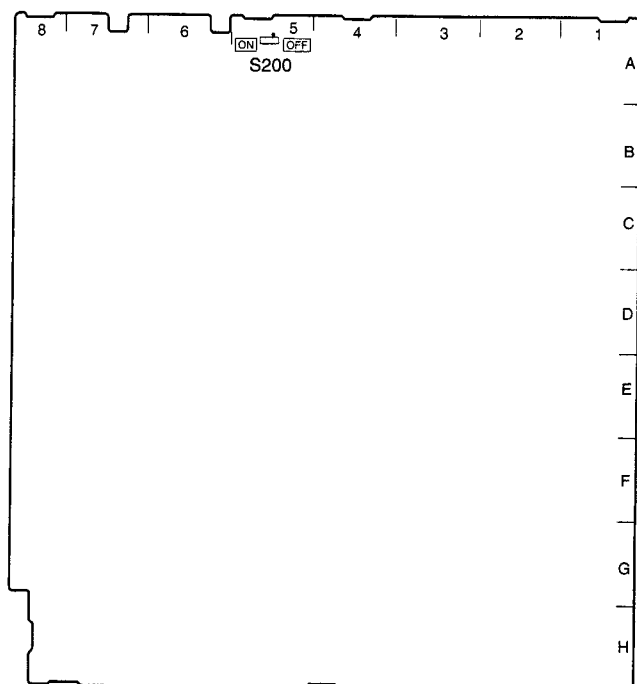
A side (component side)

Ref No.	Name	Description	Factory Setting
S200	A/D LEVEL REF	Use this switch when performing the A/D level adjustment. When this switch is set to ON, the standard-level signal generated based on the internal data is output to adjust the A/D level. Return the setting of the switch (S200) to OFF position. **Note** The switch (S200) on the DDE-15/15P board functions only when the switch (S400-1) on the SSS-10 board is set to ON position.	OFF

2-6-3. System Adjustment After Installation

Observe the following precautions when this equipment is used for editing system.

* The REF. VIDEO INPUT requires video signal which is in conformity with the RS-170A (NTSC).
* Adjust the sync phase of this equipment to the system sync with [SYNC PHASE] control on the front panel.
* Adjust the SCH phase of this equipment to the system SCH with [SC PHASE] control on the front panel.
* When this unit is connected to a switcher that does not have the sync switching function, the SYNC/BURST level adjustment is required.

Section 3
Service Overview

3-1. Location of Main Parts

3-1-1. Location of Printed Circuit Boards
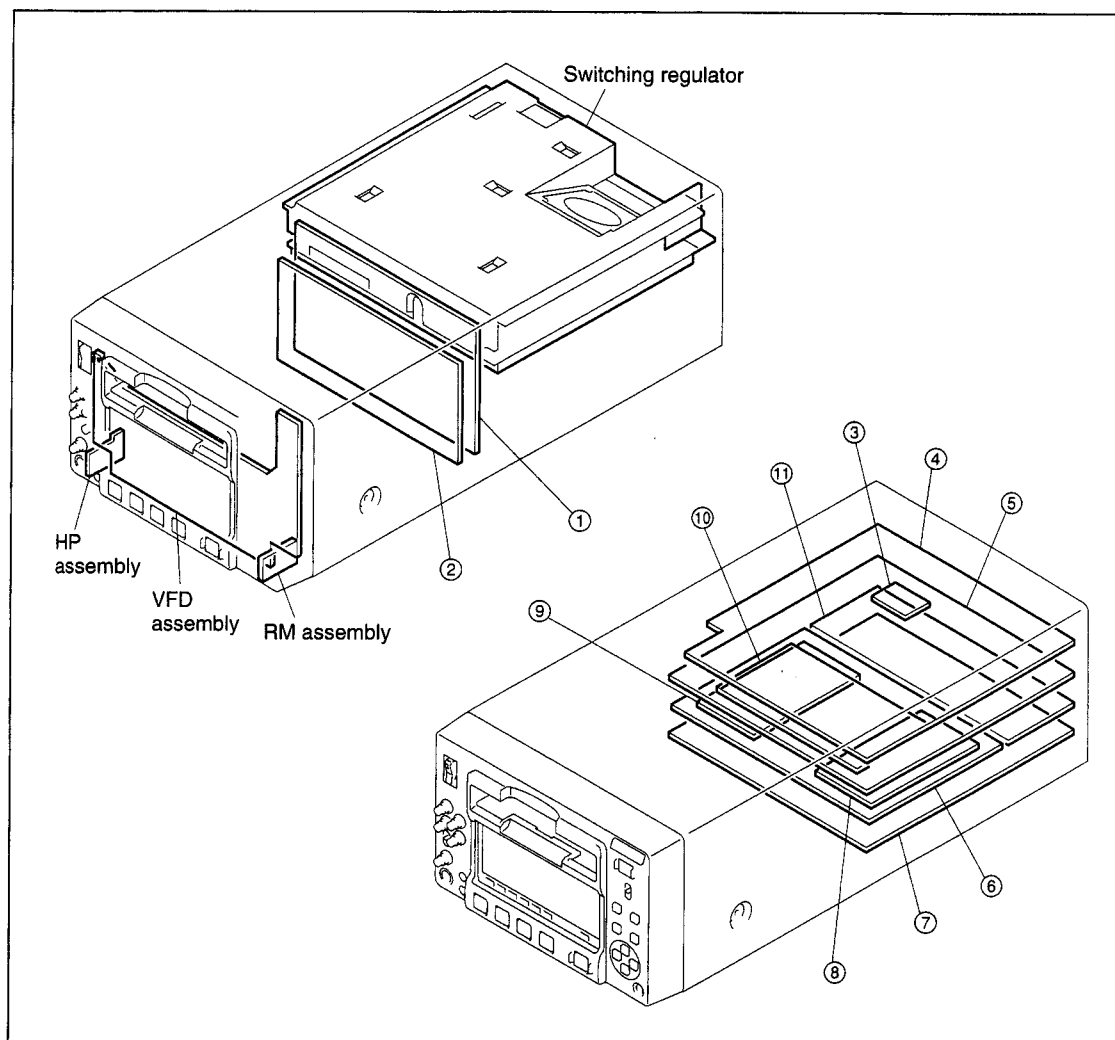
	Board Name	Circuit Configuration
①	MB-909	Motherboard
②	RP-117	RF REC/PB, ATF Detection
③	CN-2103 (DSBK-1503)	DV/i.Link Connector Board
④	DDE-15/15P (DSBK-1504)	Audio/Video Analog Input Board
⑤	AVP-3/3P	Audio/Video Analog Output Board
⑥	DVP-19	Video/Audio Digital Process
⑦	SSS-10	Super Syscon/Servo
⑧	FU-78AP	Video Process (PB)
⑨	FU-78AR	Video Process (REC)
⑩	DV-25 (DSBK-1503)	DV/i.LINK Input/Output Board
⑪	SDI-58 (DSBK-1501)	Digital Input/Output Board

Locations of mechanism deck
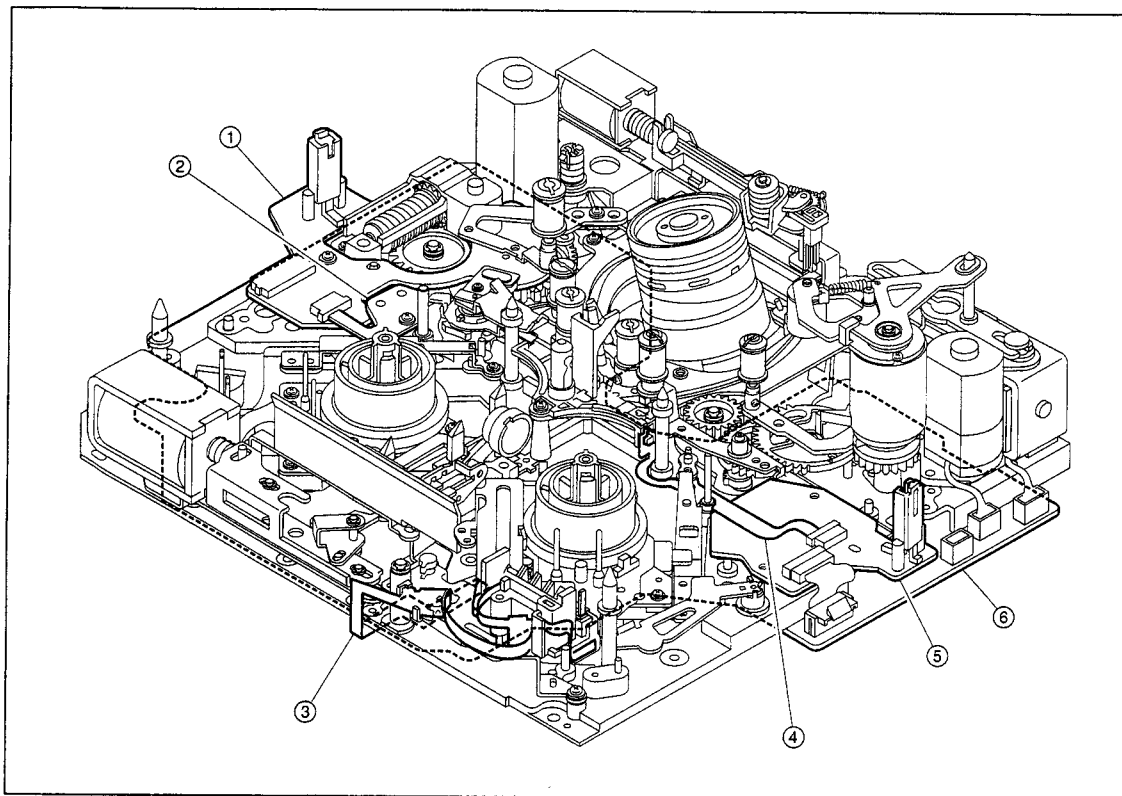
No.	Board Name	Circuit Configuration
①	SE-521	Mode sensor/tape end sensor/loading motor FG sensor
②	SE-538	Tension sensor
③	CN-1863	Sensor input/output board
④	SE-525	LED signal board
⑤	SE-522	Tape top sensor/reel position sensor (Mini/M/Standard)
⑥	DR-428	Servo/mechanism control

Locations of cassette compartment
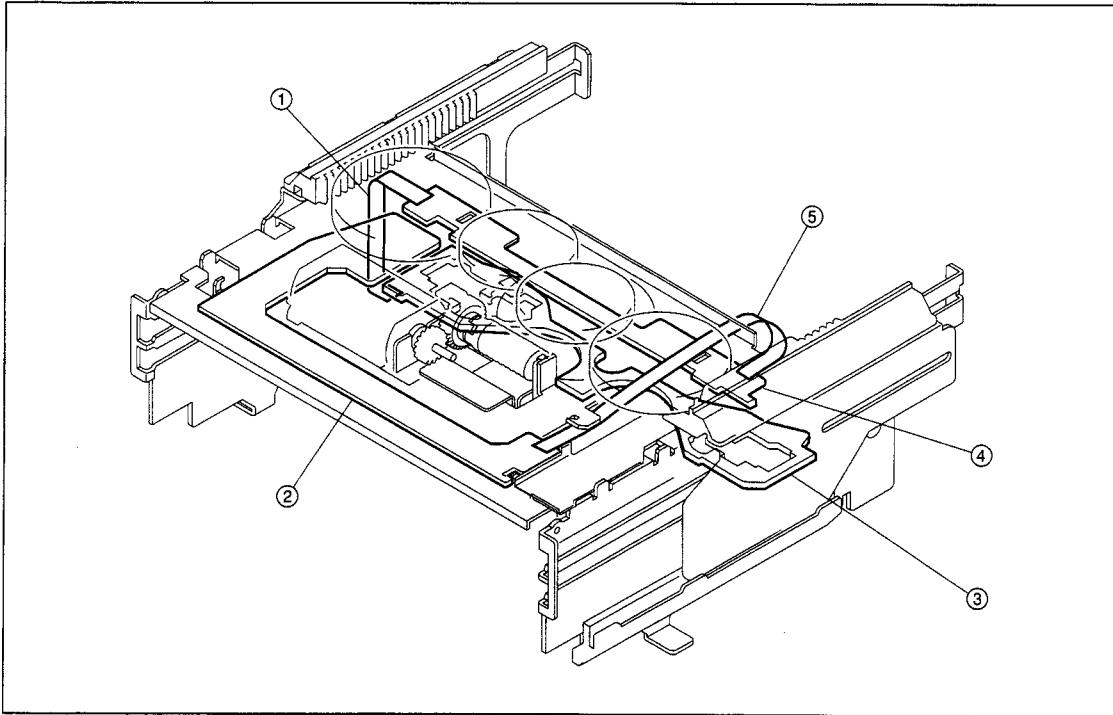
No.	Board Name	Circuit Configuration
①	CN-2021	Intermediate board between CC-84 and CC-83
②	CC-83	Cassette compartment mode detection/intermediate board
③	CC-85	Cassette compartment cassette in detection
④	CC-84	Cassette compartment cassette type detection
⑤	CN-2022	Intermediate board between CC-85 and CC-84

3-1-2. Location of Main Mechanical Parts
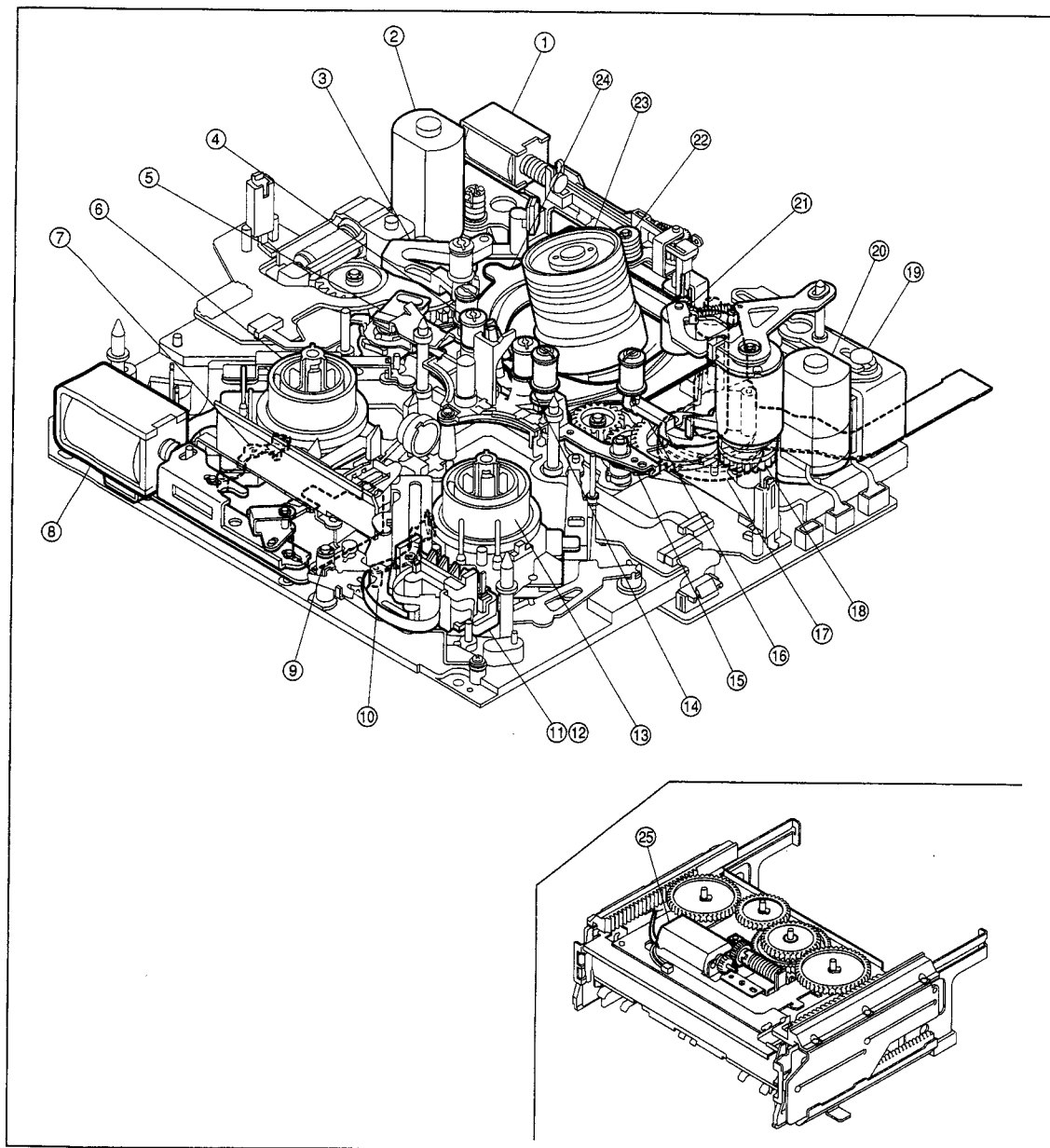
1. Head cleaning solenoid
2. Loading motor
3. TG1 arm assembly
4. Shuttle (left) assembly
5. S tension regulator assembly
6. S reel motor
7. S brake assembly
8. Brake solenoid
9. M stop solenoid assembly
10. T brake assembly
11. MIC assembly
12. MIC holder assembly
13. T reel motor

14. Shuttle (right) assembly
15. T drawer arm assembly
16. TG8 arm assembly
17. Capstan motor
18. Elevator cam
19. Pinch solenoid assembly
20. Reel shift motor
21. Pinch roller
22. HC roller assembly
23. Drum assembly
24. Rail assembly
25. Cassette compartment motor assembly

3-1-3. Location of Sensors

(1) Mechanism deck
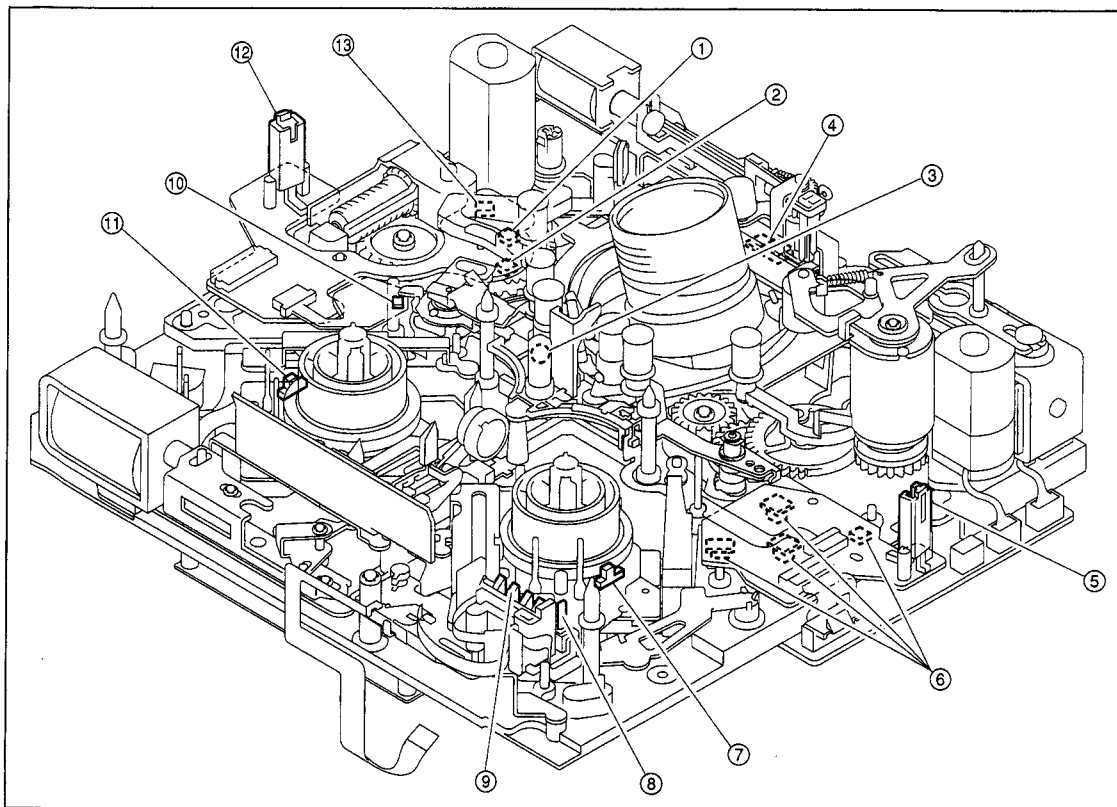
①, ② Mode sensor
   Detects the mechanism position during threading.

③ Tape top/end detect LED
   Detects the top and end of a tape.

④ Condensation sensor
   Detects condensation occurred in DSR-1500/1500P.

⑤ Tape top sensor
   Detects the beginning of a tape that runs in the REV direction.

⑥ Reel position sensors (4 pieces) (Mini, M, Standard reel position)
   Detects the reel table position at the each specified reel position according to the cassette type.

⑦ Reel FG sensor (Take-up side)
   Detects rotation of the take-up reel table. The FG output of the sensor is sent to the servo circuit and used to control the rotating speed and torque of the reel motor.

⑧ Record proof sensor (common to standard, M and mini size cassettes)
   Protects a tape from mis-recording.

⑨ Cassette memory terminal
   Determines whether cassette memory is used, and reads and writes data to and from the cassette memory.

⑩ Tension sensor
   The tension arm keeps the tension of a running tape constant during recording and playing. The tension sensor detects the mechanical position of the tension arm.

⑪ Reel FG sensor (Supply side)
   Detects the rotation of the supply reel table. The PG output of the sensor is input to the servo circuit and controls the rotating speed and torque of the reel motor.

⑫ Tape end sensor
   Detects the end of a tape that runs in the FWD direction.

⑬ Threading motor FG sensor
   Detects the rotation speed of the gearbox motor. The FG output of the sensor is input to the servo circuit and controls the threading speed so that excessive force is not applied to the tape during threading.

(2) Cassette compartment
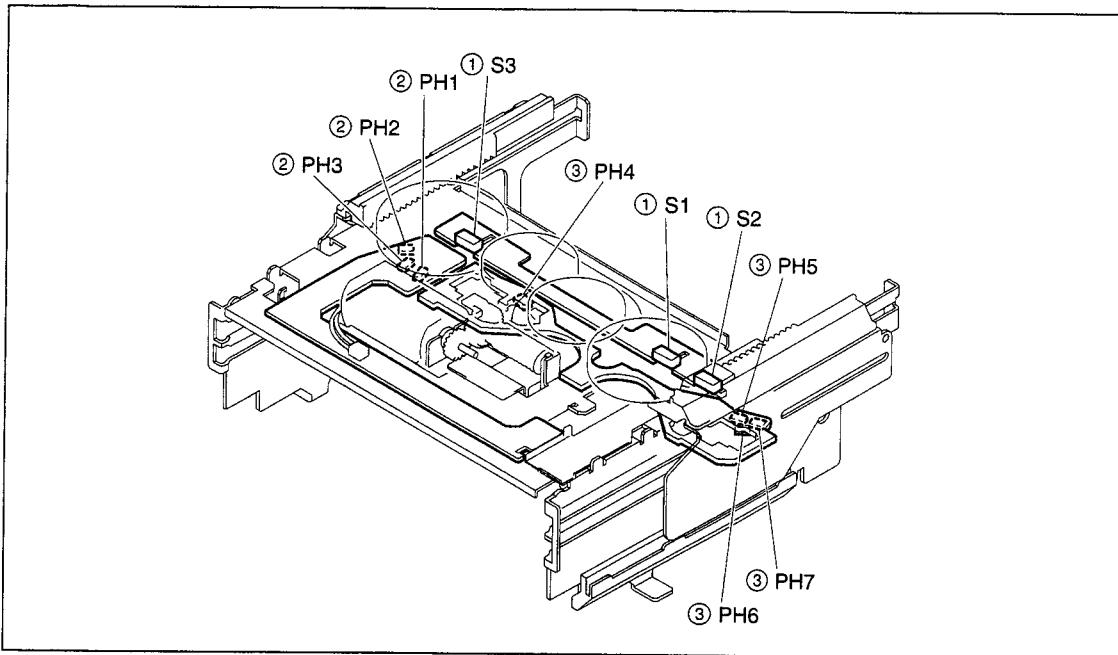
① The sensors S1, S2 and S3 discriminate the inserted cassette type among the mini, M, standard cassettes and the cassette adaptor for DVCPRO by on/off of the sensors.

② The sensors PH1, PH2 and PH3 detect the movement of a cassette compartment by their combination.

③ The sensors PH4 and PH5 detect that a mini cassette got inserted.
The sensors PH4 and PH6 detect that a M cassette got inserted.
The sensors PH4 and PH7 detect that a standard cassette got inserted.

3-2. Functions of Record Proof Hole and Record Proof Plug of Cassette

Standard cassette, M cassette

Cassette cover release claw

Record proof hole

Record proof plug

4 3 2 1

Reel rotation stopper

Mini cassette

Cassette cover release claw

Record proof hole

Record proof plug

4 3 2 1

Reel rotation stopper
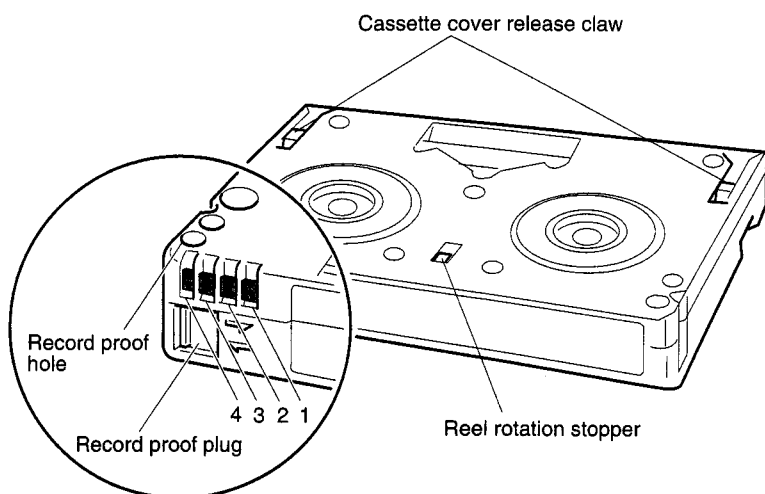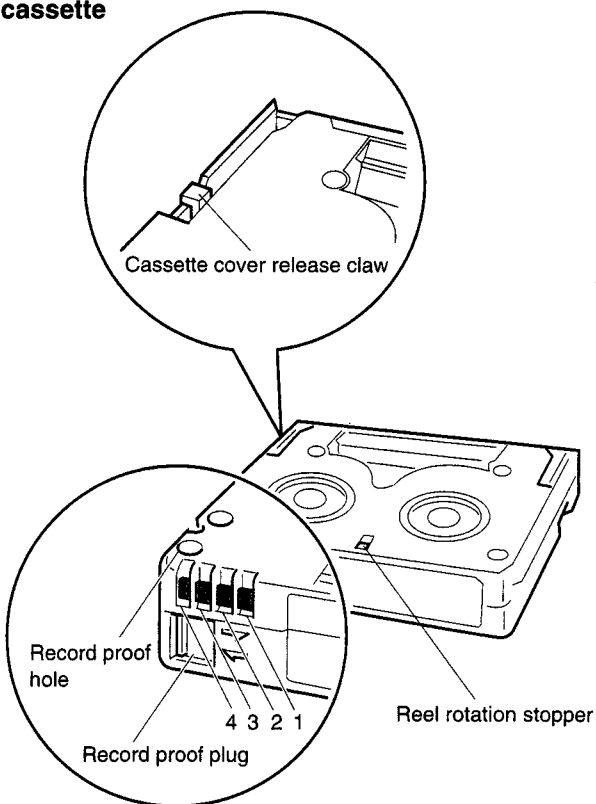
Hole and plug for record proof

Record enable	Record protect
REC ➡	REC ➡
SAVE ⬅	SAVE ⬅

• This plug controls the record proof switch according to open or close position.
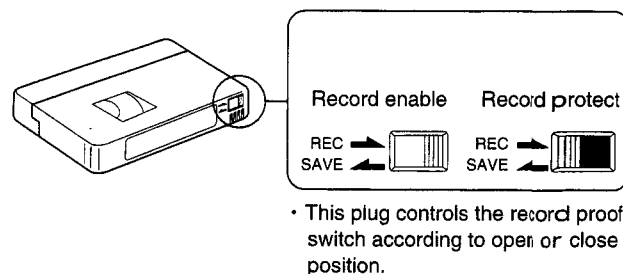
Pin No.	Function	
	Equipped with built-in memory	**Not equipped with built-in memory**
1	+DC	Detecting tape thickness
2	DATA	Detecting tape type (Example: ME/MP)
3	CLOCK	Detecting tape application (Example: consumer/professional)
4	GND	–

3-3. Removing/Installing the Cabinets

Note

Before removing the cabinets, be sure to turn off the main power.

Removal/Installation of the Cabinets

1. Remove the four screws and remove the top panel in the direction of the arrow.

   Note

   Be careful not to break or peel off the internal packing.

2. Re-attach the parts in reverse order of the disassembling procedure.

Top panel

B4 × 6

B4 × 6
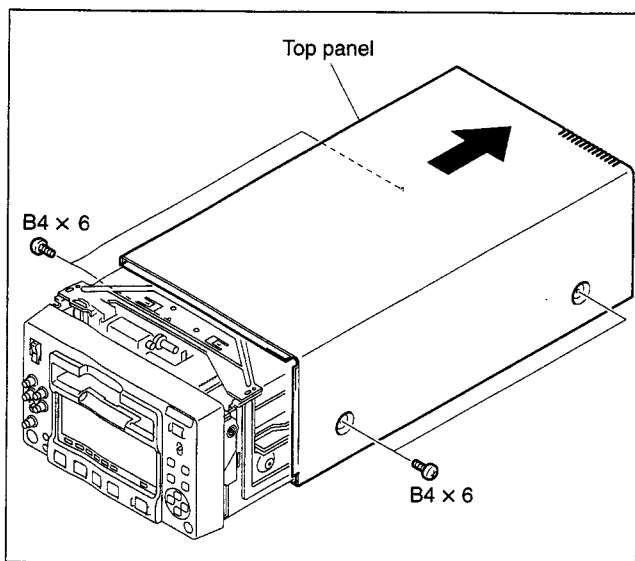
Removal/Installation of the Bottom Plate

1. Stand the main unit on the left side.
2. Remove the two screws and remove the bottom plate in the direction of the arrow.
3. Re-attach the parts in reverse order of the disassembling procedure.

Holes

Claws

BVTT3 × 6

Bottom plate

BVTT3 × 6
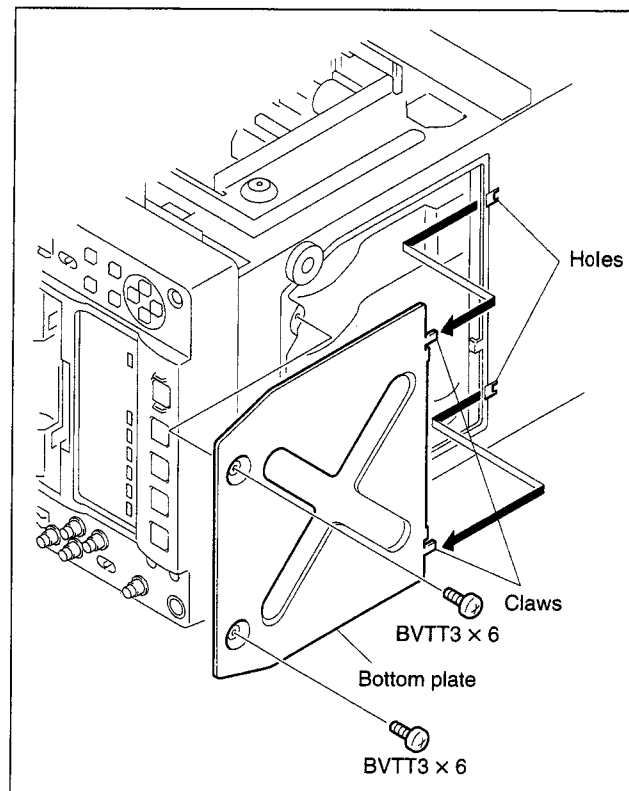
Removal/Installation of the Front Panel

1. Remove the top panel. (Refer to Section 3-3.)
2. Remove the bottom panel. (Refer to Section 3-3.)
3. Remove the flexible card wire connected to the connector (CN81) on the MB-909 board.
4. Remove the harness connected to the connector (CN2) on the switching regulator.
5. Remove the four screws.
6. Pull the front panel to the front to remove it.
7. Re-attach the parts in reverse order of the disassembling procedure.
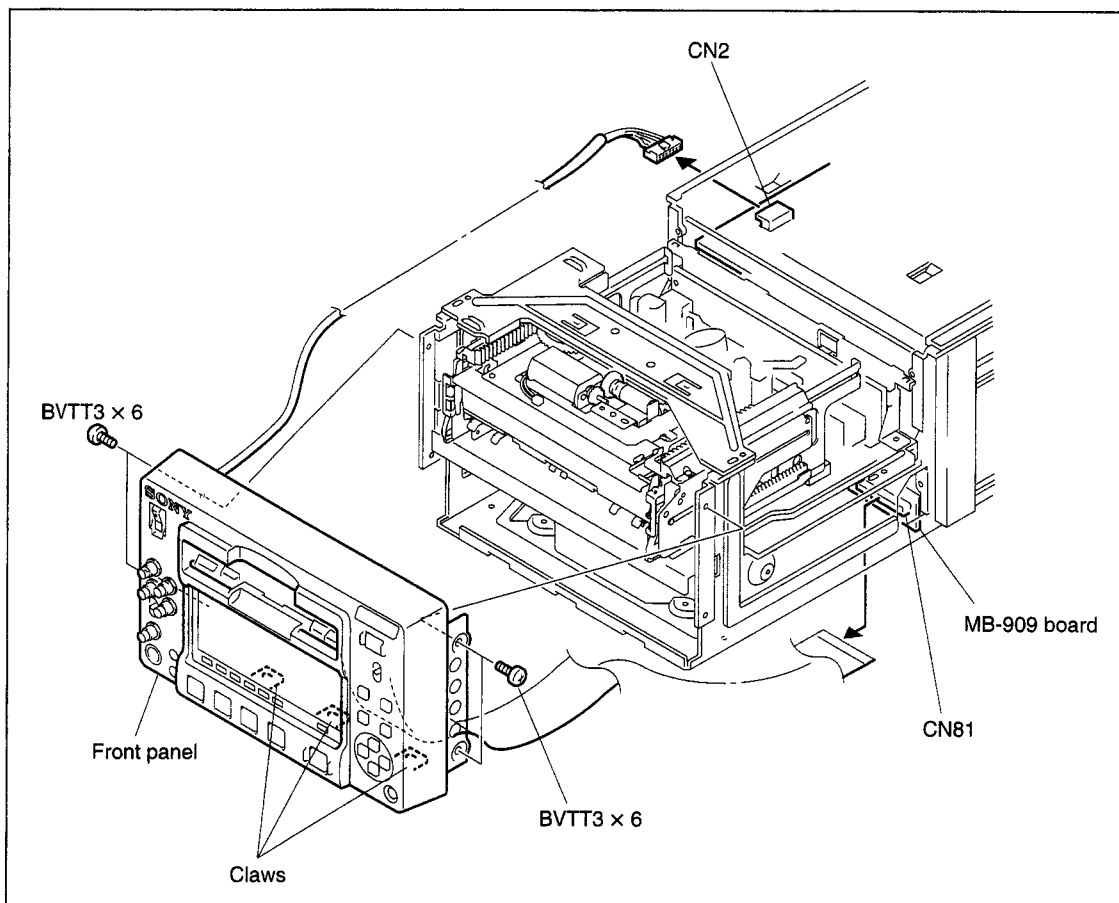
3-4. Removing/Installing the Cassette Compartment

S/N : 100001 through 100070 (DSR-1500)
400001 through 4000140 (DSR-1500P)

Removal

1. Remove the top panel. (Refer to Section 3-3.)
2. Remove the C cable retainer.
3. Remove the flexible card wire connected to the connector (CN1) on the CC-83 board.
4. Remove the two screws and remove the protector and the cassette compartment retainer.
5. Remove the cassette compartment n the direction of the arrow.

Installation

1. Put in the cassette compartment in the opposite direction of the arrow and align the four positioning holes with the four positioning pins.
2. Attach the protector and the cassette compartment with the two screws.
3. Connect the flexible card wire to the connector (CN1) on the CC-83 board.
4. Attach the C cable retainer.
5. Attach the top panel. (Refer to Section 3-3.)

C cable retainer

Flexible card wire

BVTT 3 × 6

Protector

Position hole

Cassette compartment retainer

Connecotr (CN1)

CC-83 board

Positioning hole

Positioning pins

Cassette compartment

Positioning holes

Positioning pins

S/N : 100071 or hgiehr (DSR-1500)
400141 or higher (DSR-1500P)

Removal

1. Remove the top panel. (Refer to Section 3-3.)
2. Remove the C cable retainer.
3. Remove the flexible card wire connected to the connector (CN1) on the CC-83 board.
4. Remove the two screws and remove the cassette compartment retainer.
5. Remove the cassette compartment n the direction of the arrow.

Installation

1. Put in the cassette compartment in the opposite direction of the arrow and align the four positioning holes with the four positioning pins.
2. Attach the cassette compartment with the two screws.
3. Connect the flexible card wire to the connector (CN1) on the CC-83 board.
4. Attach the C cable retainer.
5. Attach the top panel. (Refer to Section 3-3.)
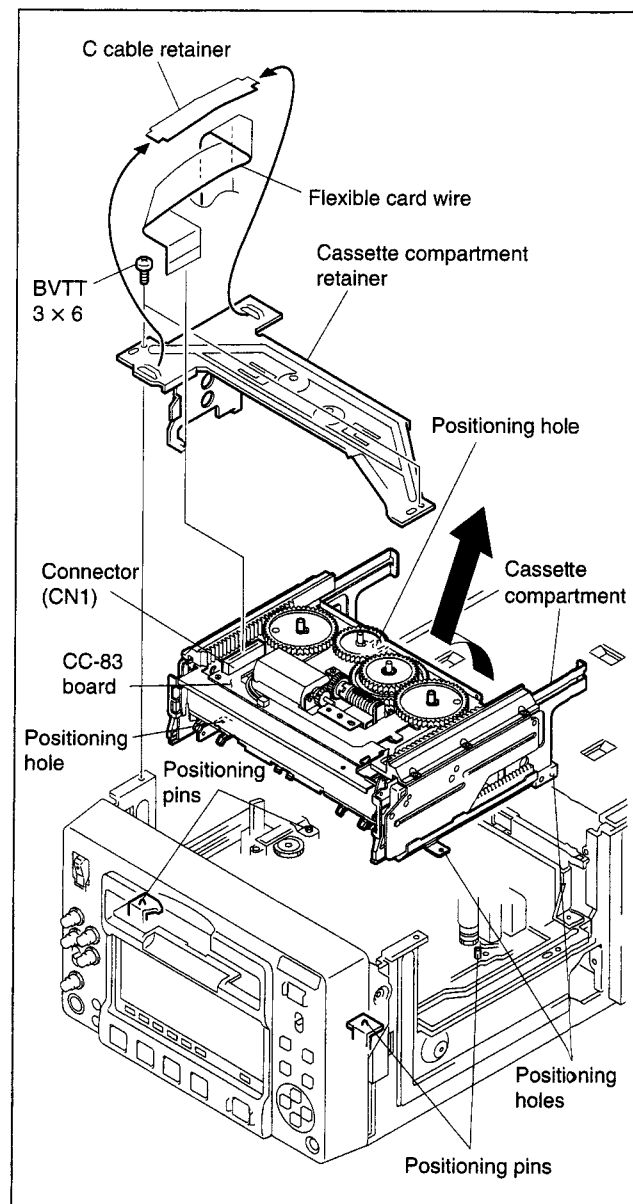
Note

The protector cannot be attached because the cassette compartment retainer has changed its shape for higher strength on and after serial number 100071 (DSR-1500) or 400141 (DSR-1500P).

C cable retainer

Flexible card wire

Cassette compartment retainer

BVTT 3 × 6

Positioning hole

Connector (CN1)

Cassette compartment

CC-83 board

Positioning hole

Positioning pins

Positioning holes

Positioning pins

S/N : 100001 through 100070 (DSR-1500) S/N : 400001 through 400140 (DSR-1500P)	S/N : 100071 or higher (DSR-1500) S/N : 400141 or higher (DSR-1500P)
	There are projections.
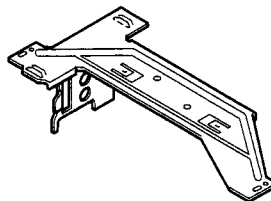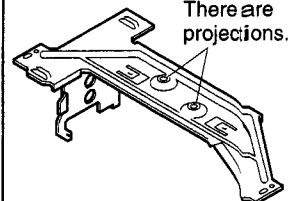
3-5. Removing/Installing the MD Assembly

| Note |

Before removing the assembly, be sure to turn off the main power.

Removal

1. Remove the top panel. (Refer to Section 3-3.)
2. Remove the bottom panel. (Refer to Section 3-3.)
3. Remove the harnesses and the flexible card wires connected to the three connectors (CN302, CN303, CN301) on the DR-428 board.
4. Remove the flexible card wire connected to the connector (CN102) on the RP-117 board.
5. Remove the front panel. (Refer to Section 3-3.)
6. Remove the three screws and remove the MD assembly.

Installation

1. Insert the positioning pins on the main unit into the positioning holes on the MD assembly.
2. Attach the MD assembly with the three screws.
3. Attach the front panel. (Refer to Section 3-3.)
4. Connect the harnesses and flexible card wires to the three connectors (CN302, CN303, CN301) on the DR-428 board and the connector (CN102) on the RP-117 board.
5. Attach the bottom panel. (Refer to Section 3-3.)
6. Attach the top panel. (Refer to Section 3-3.)
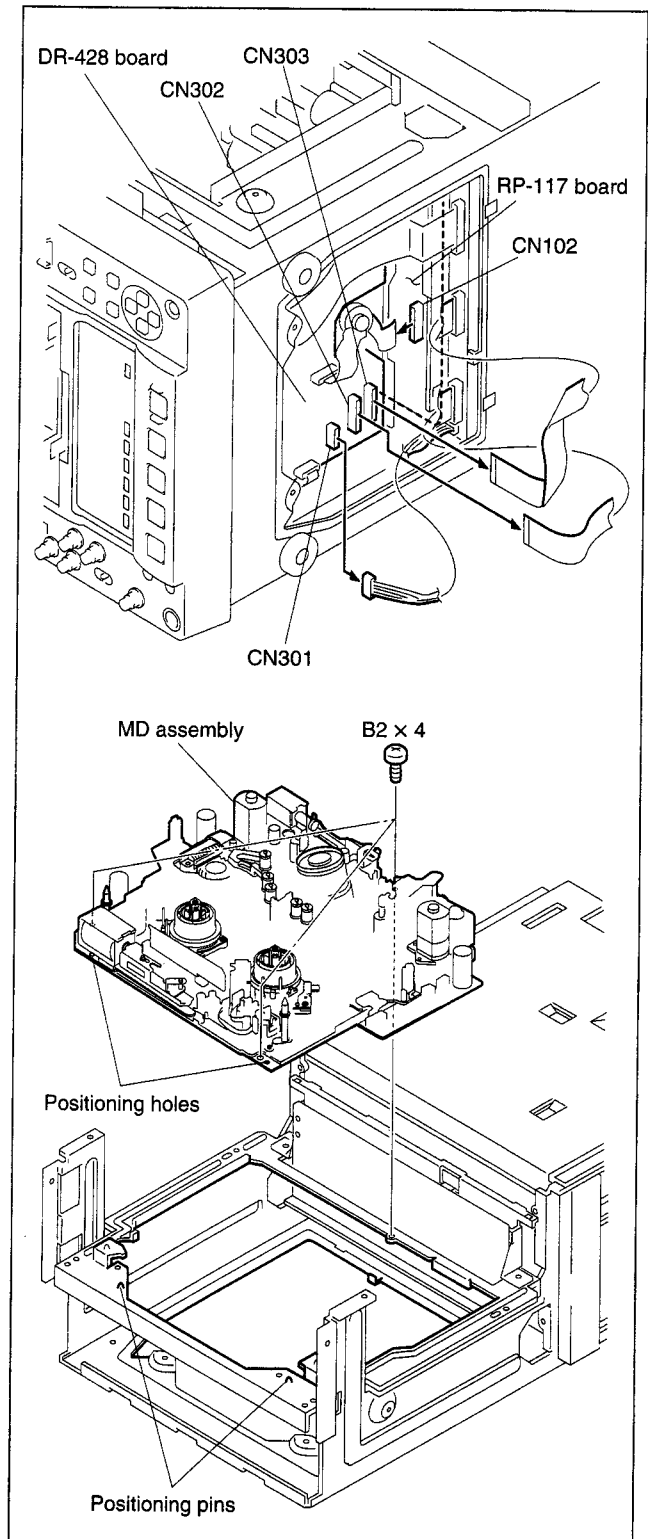
3-6. Removing/Installing the Switching Regulator

| Note |

Before removing the regulator, be sure to turn off the main power.

Removal

1. Remove the top panel. (Refer to Section 3-3.)
2. Remove the four screws and remove the rear panel. (Refer to Section 3-7-1.)
3. Remove the four screws and remove the switching regulator in the direction of the arrow.
4. Re-attach the parts in reverse order of the disassembling procedure.
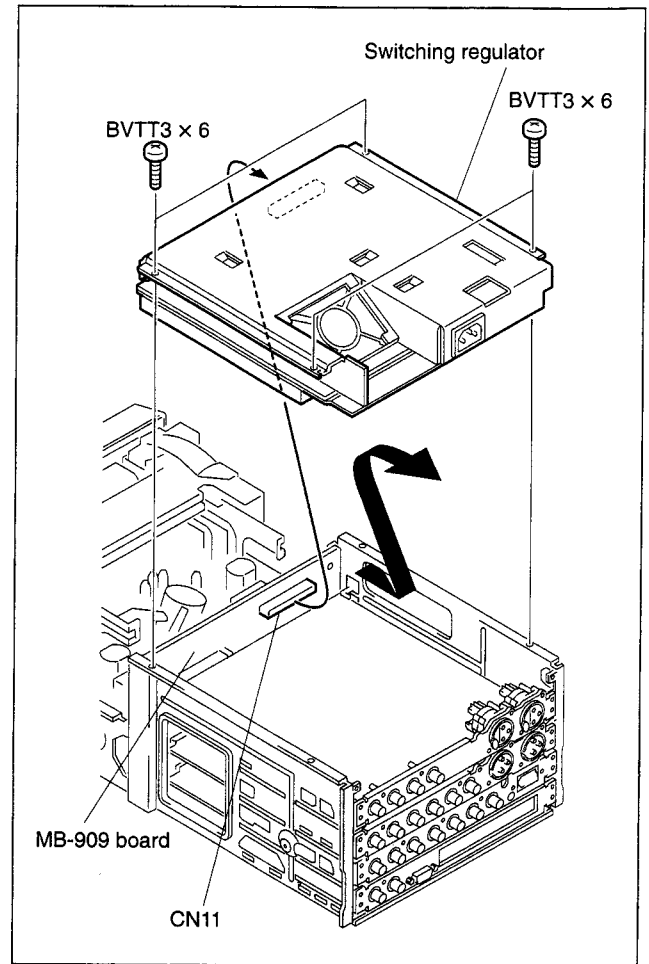
3-7. How to Remove/Install the Boards

3-7-1. Removing/Installing the Boards

| Note |

Before removing the boards, be sure to turn off the main power.

Removal/Installation of the AVP-3/3P Board

1. Remove the top panel. (Refer to Section 3-3.)
2. Remove the six screws and remove the rear panel.
3. Pull out the AVP-3/3P board in the direction of the arrow.
4. Re-attach the parts in reverse order of the disassembling procedure.

BVTT3 × 6

Rear panel

BVTT3 × 6

AVP-3/3P board
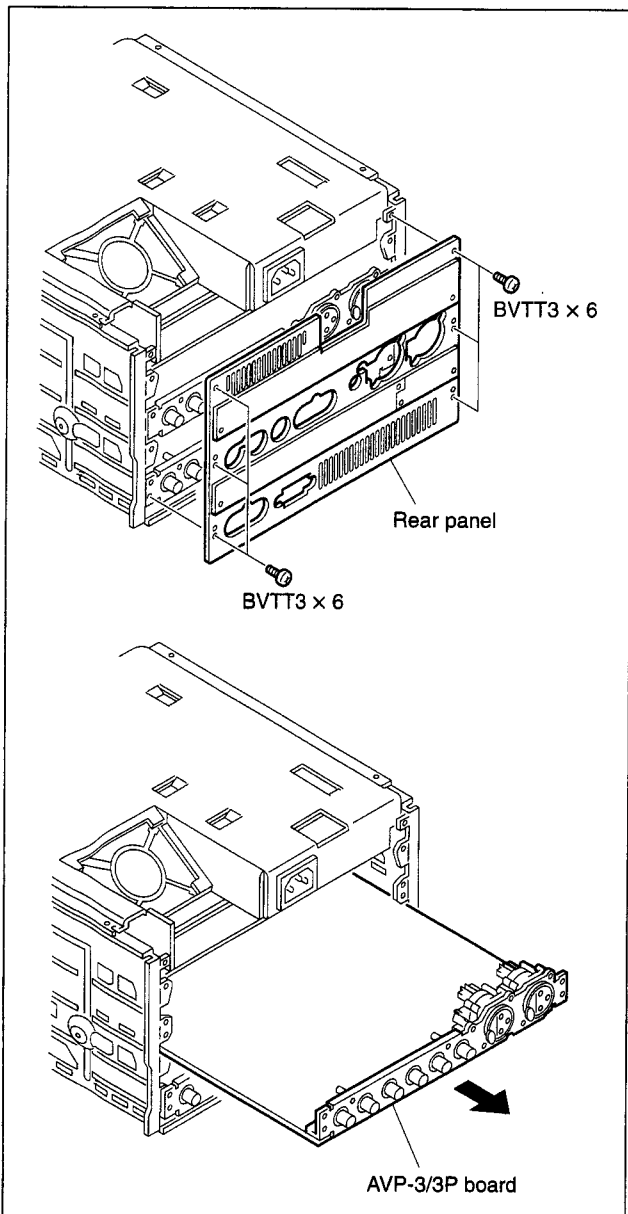
Removal/Installation of the SSS-10 Board

1. Remove the top panel. (Refer to Section 3-3.)
2. Remove the six screws and remove the rear panel.
3. Pull out the SSS-10 board in the direction of the arrow.
4. Re-attach the parts in reverse order of the disassembling procedure.

SSS-10 board
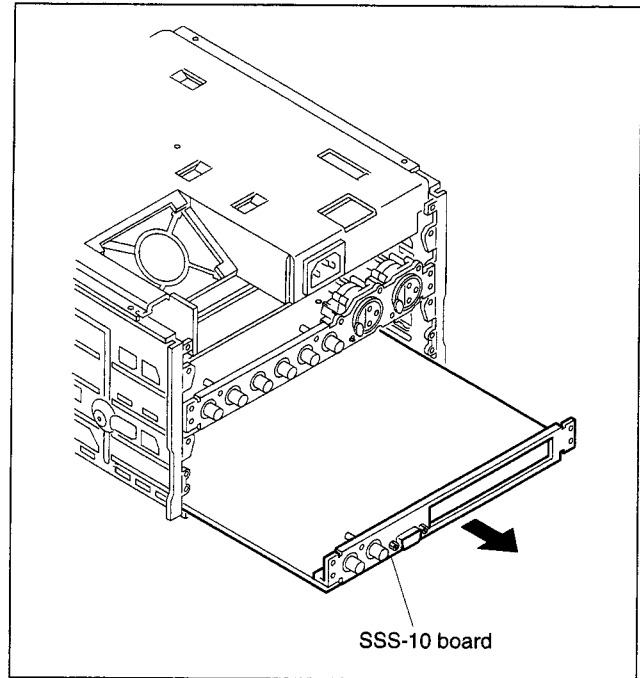
Removal/Installation of the MB-909 Board

1. Remove the top panel. (Refer to Section 3-3.)
2. Remove the bottom panel. (Refer to Section 3-3.)
3. Remove the harnesses and the flexible card wires connected to the four connectors (CN71, CN72, CN73, CN81) on the MB-909 board.
4. Remove the AVP-3/3P board.
5. Remove the SSS-10 board.
6. Remove the switching regulator. (Refer to Section 3-6.)
7. Remove the four screws and remove the MB-909 board.
8. Re-attach the parts in reverse order of the disassembling procedure.
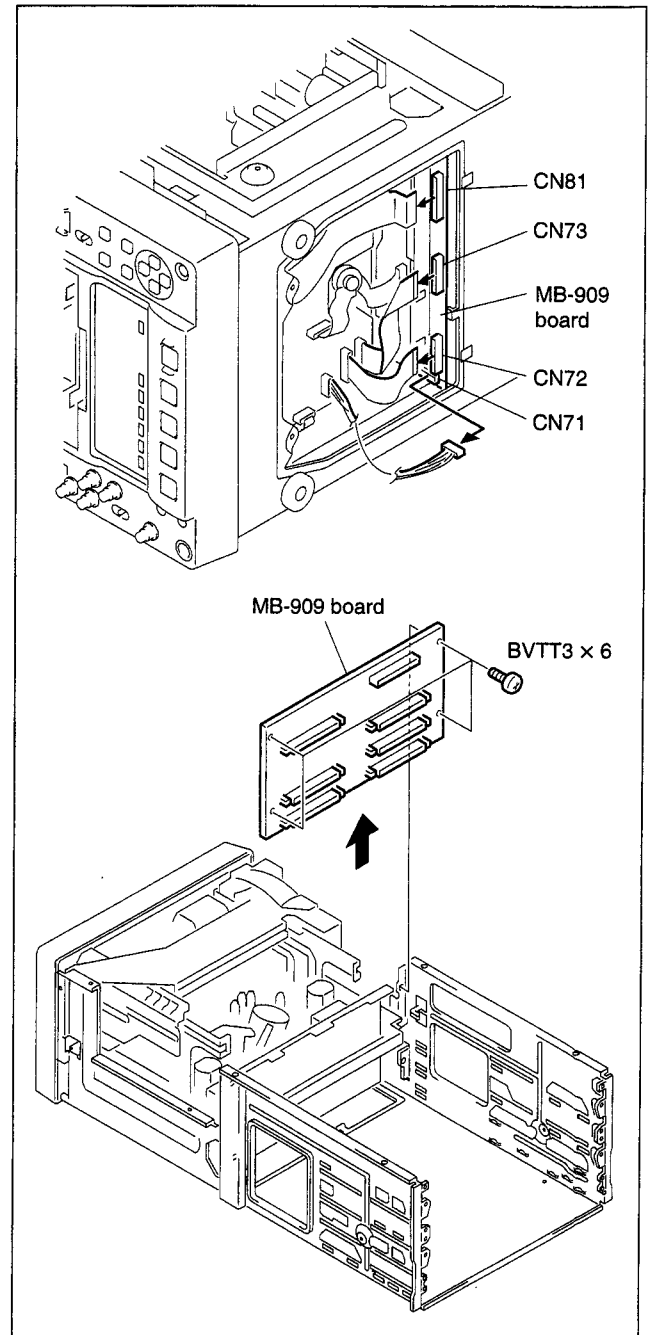
Removing/Installing the RP-117 Board

1. Remove the top panel. (Refer to Section 3-3.)
2. Remove the bottom panel. (Refer to Section 3-3.)
3. Remove the harnesses and cables from the four connectors on the MB-909 board. (Refer to "Removal/Installation of the MB-909 Board")
4. Remove the flexible card wire connected to the connector (CN102) on the RP-117 board.
5. Remove the two screws and remove the shield case (R) and the RP attachment panel.
6. Remove the two screws and remove the RP-117 board.
7. Re-attach the parts in reverse order of the disassembling procedure.
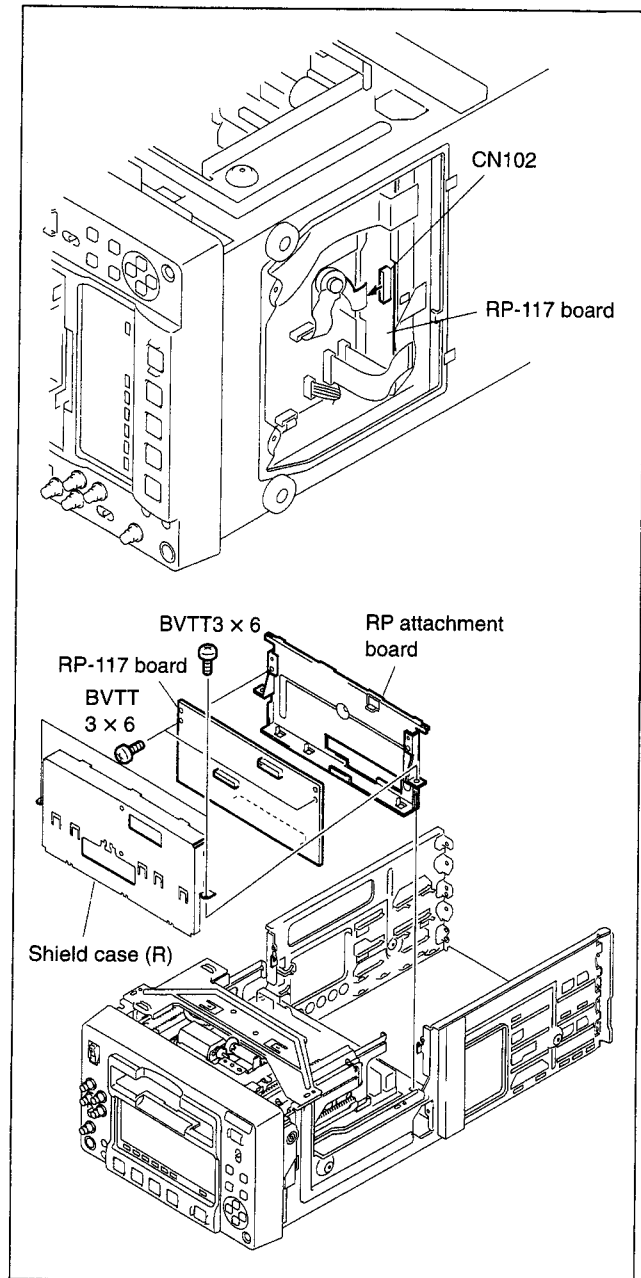
Removing/Installing the VFD Assembly, RM Assembly and HP Assembly

| Note |

Before removing the boards, be sure to turn off the main power.

1. Remove the front panel. (Refer to Section 3-3.)
2. Remove the five knobs.
3. Remove the two screws (PS3 × 5) and remove the cassette guide assembly.
4. Remove the two screws (BTP3 × 10) from the front panel assembly and the two screws (BTP3 × 10) from the VFD assembly, then remove the front chassis.
5. Remove the harness connected to the connectors (CN2, CN1) on the VFD assembly.
6. Remove the supplied nut and washer, then remove the RM assembly.

   | Note |

   Remove the nut while holding the RM assembly from the back.

7. Remove the supplied nut and washer, then remove the HP assembly.
8. Remove the three screws (BVTT3 × 6) and remove the VFD assembly.
9. Re-attach the parts in reverse order of the disassembling procedure.
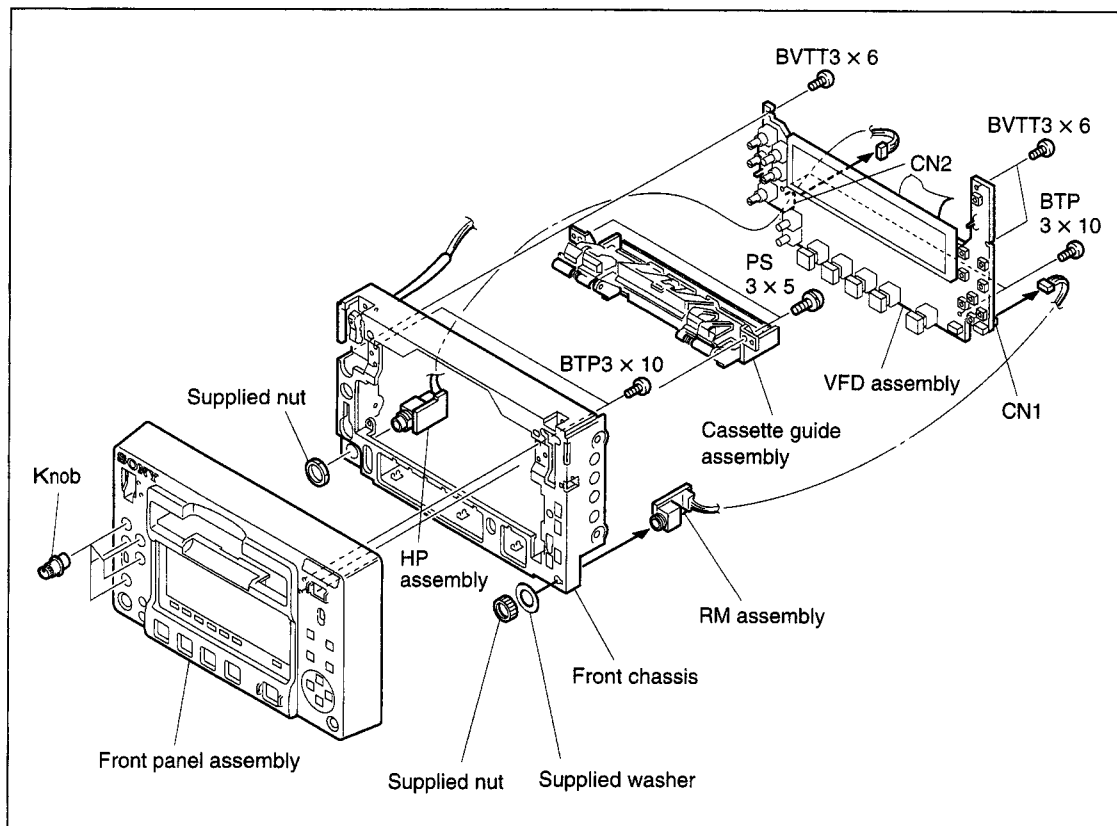
Removal/Installation of the DR-428 Board

1. Remove the top panel. (Refer to Section 3-3.)
2. Remove the bottom panel. (Refer to Section 3-3.)
3. Remove the cassette compartment.
   (Refer to Section 3-4.)
4. Remove the harnesses and cables from the seven connectors (CN4, CN10, CN11, CN3, CN19, CN20, CN21) on the DR-428 board.
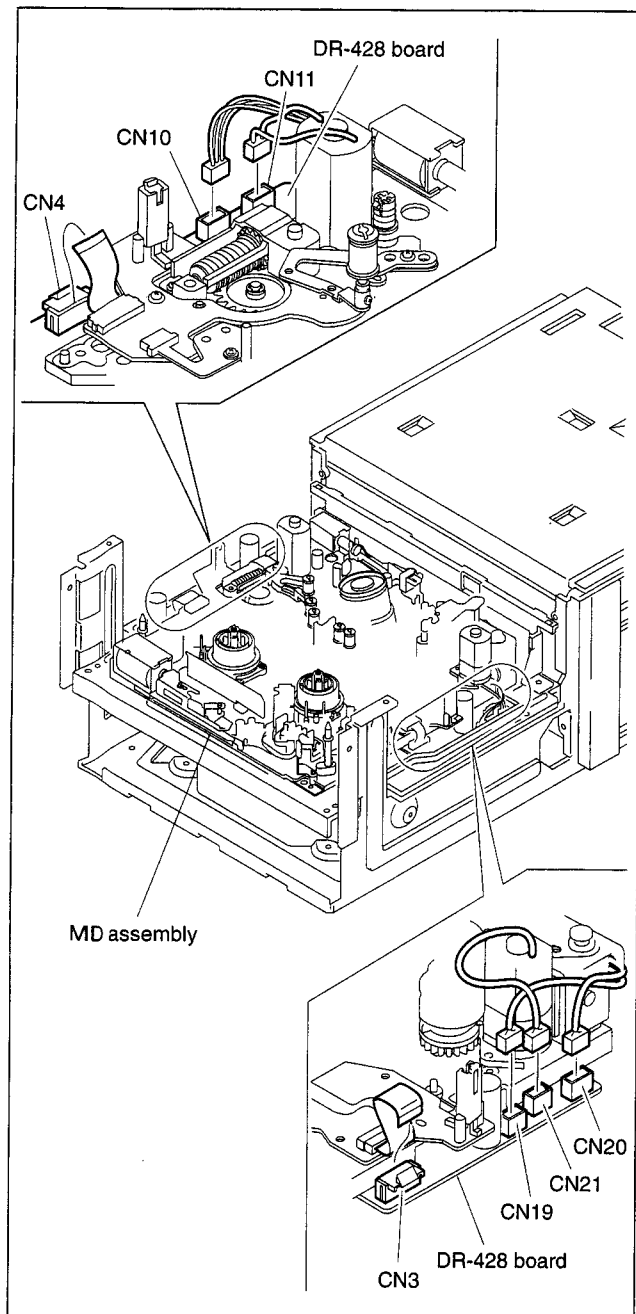
5. Stand the unit with the left side down.
6. Remove the harnesses and cables from the 11 connectors (CN1, CN12, CN13, CN14, CN15, CN16, CN17, CN18, CN301, CN302, CN303) on the DR-428 board.
7. Remove the flat cable from the connector (CN102) on the RP-117 board.
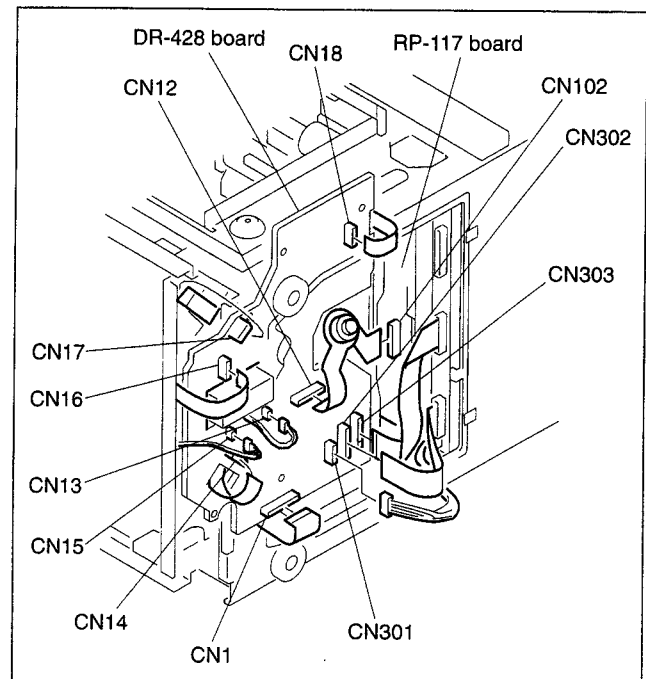
8. Remove the six screws securing the DR-428 board.
9. Re-attach the parts in reverse order of the disassembling procedure.

   | Note |

   When attaching the parts, align the two positioning holes on the DR-428 board with the positioning pins.
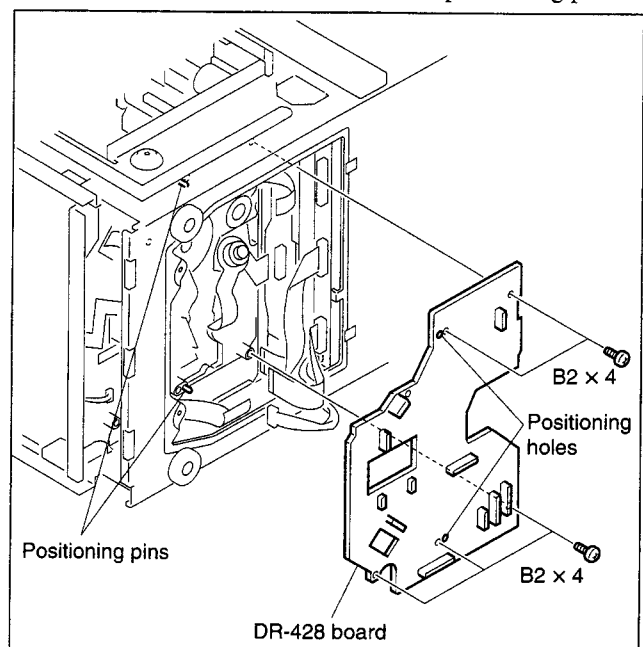
Removal/Installation of the SE-521 Board

1. Remove the top panel. (Refer to Section 3-3.)
2. Remove the cassette compartment. (Refer to Section 3-4.)
3. Remove the TG1 arm assembly. (Refer to Section 7-13.)
4. Remove the loading motor assembly.
   (Refer to Section 7-18.)
5. Remove the flexible card wire connected to the connector (CN3) on the SE-521 board.
6. Remove the flexible card wire connected to the connector (CN4) on the SE-521 board.
7. Remove the screw and remove the SE-521 board.
8. Insert the hole and long hole on the SE-521 board into the two shafts of the chassis and fix the board with a screw.
   Tightening torque : 0.1·Nm {1 kgf·cm}
   | **Note** |

   Do not pinch the tip of the flexible card wire on the S tension regulator assembly in between the SE-521 board and the MD chassis.
   Put the board under the claw of the warm holder.

9. Connect the flexible card wire to the connector (CN4) on the SE-521 board.
10. Connect the flexible card wire on the S tension regulator assembly to the connector (CN3) on the SE-521 board.
11. Attach the loading motor assembly.
    (Refer to Section 7-18.)
12. Attach the TG1 arm assembly. (Refer to Section 7-13.)

P1.4 × 3.5
Connector (CN4)
Connector (CN3)
Claw of warm holder
Flexible card wire
Flexible card wire
SE-521 board
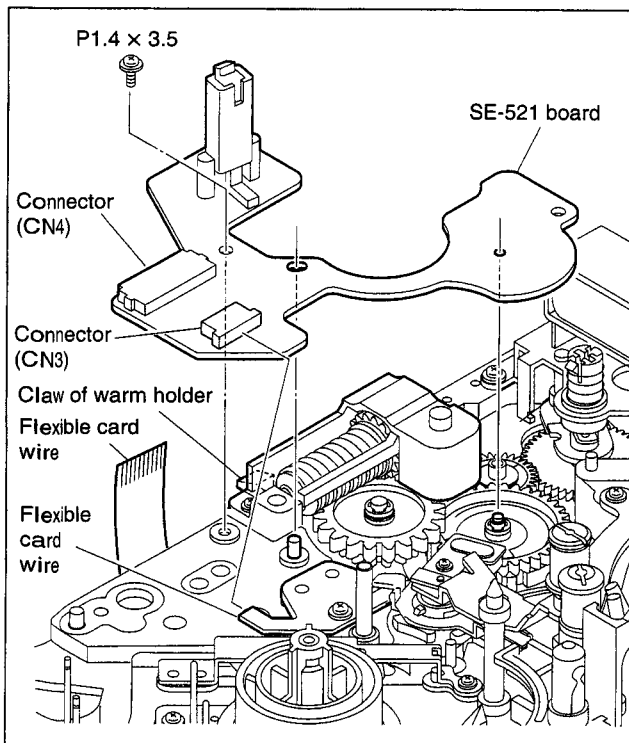
Removal/Installation of the SE-522 Board

1. Remove the top panel. (Refer to Section 3-3.)
2. Remove the cassette compartment.
   (Refer to Section 3-4.)
3. Remove the flexible card wires from the connectors (CN2, CN3) on the SE-522 board.
4. Remove the two screws (P1.4 × 3.5) and remove the SE-522 board while avoiding contacting the T drawer arm assembly.
5. Insert the two positioning holes on the SE-522 board into the positioning pins on the MD chassis, and insert the sensors (PH1, PH2, PH3) into the square hole on the MD chassis.
6. Re-attach the parts in reverse order of steps 1 through 5 of the disassembling procedure.
   Tightening torque : 0.1 N·m {1 kgf·cm}

Positioning hole
Screw P1.4 × 3.5
Sensors
Sensor
CN2
SE-522 board
T drawer arm
CN3
Positioning hole
Square holes
Positioning pin
Flexible card wires
Square holes
Positioning pin
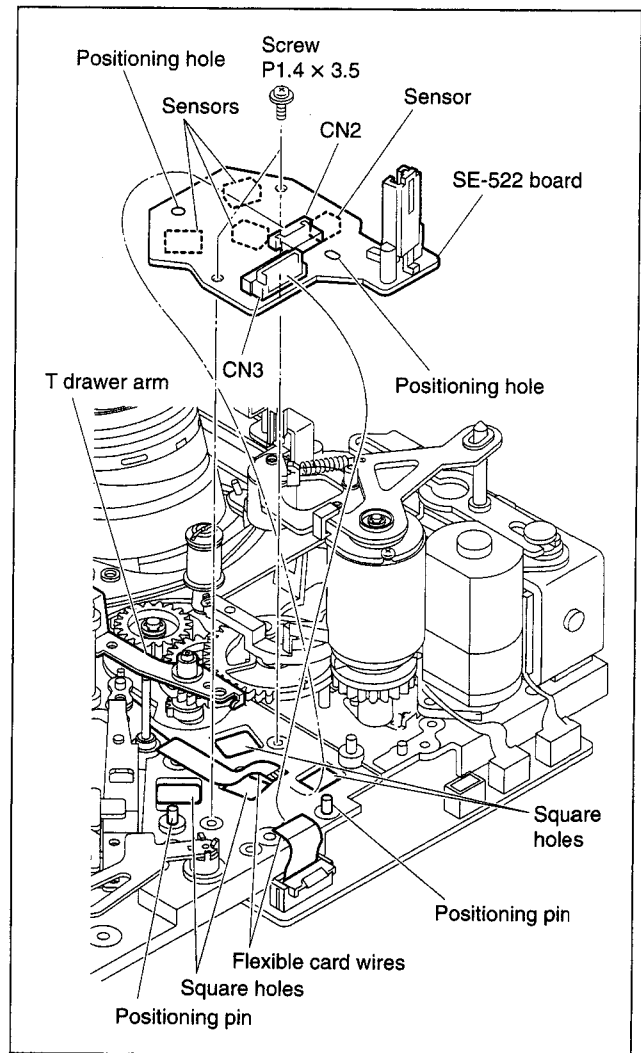
Removal/Installation of the SE-525 Board (LED Holder Assembly)

1. Remove the top panel. (Refer to Section 3-3.)
2. Remove the cassette compartment. (Refer to Section 3-4.)
3. Remove the RMP retainer (T1) assembly.
   (Refer to Section 7-8.)
4. Remove the rail assembly. (Refer to Section 7-15.)
5. Remove the LED holder assembly from the rail assembly.
6. Attach the LED holder assembly to the rail assembly.
7. Re-attach the parts in reverse order of steps 1 through 4 of the disassembling procedure.
   Tightening torque : 0.1 N•m {1 kgf•cm}

Claw

LED holder assembly

Claw

SE-525 board

Rail assembly

SE-525 board
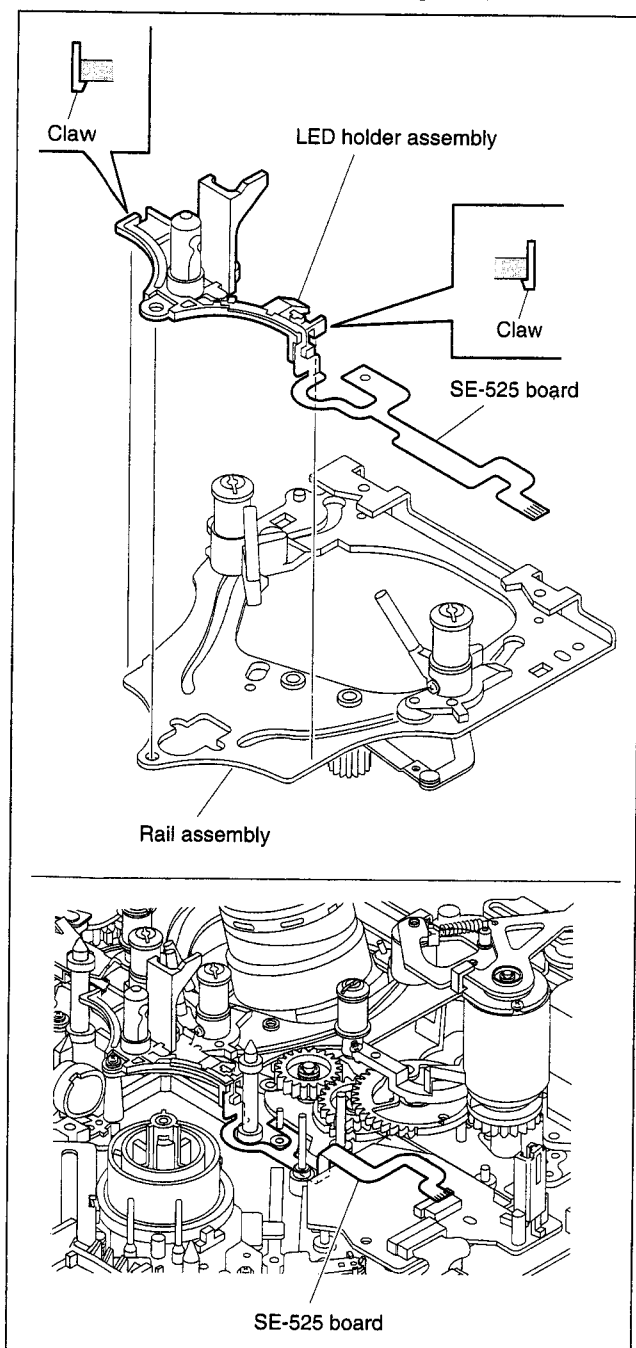
3-7-2. Extension Board

An optional extension board is supplied to check and adjust the card boards. Attach the extension board to this unit and attach the board to be checked and adjusted to the top of the extension board.

Extension board	Card boards which can be connected
DJ-495	AVP-3/3P, DVP-19, SSS-10, DDE-15/15P (DSBK-1504)

3-7-3. Installing the Extension Board

| Note |

When attaching the extension board, be sure to turn off the main power.

1. Remove the rear panel. (Refer to Section 3-7-1.)
2. Attach the extension board to the main unit as shown below.
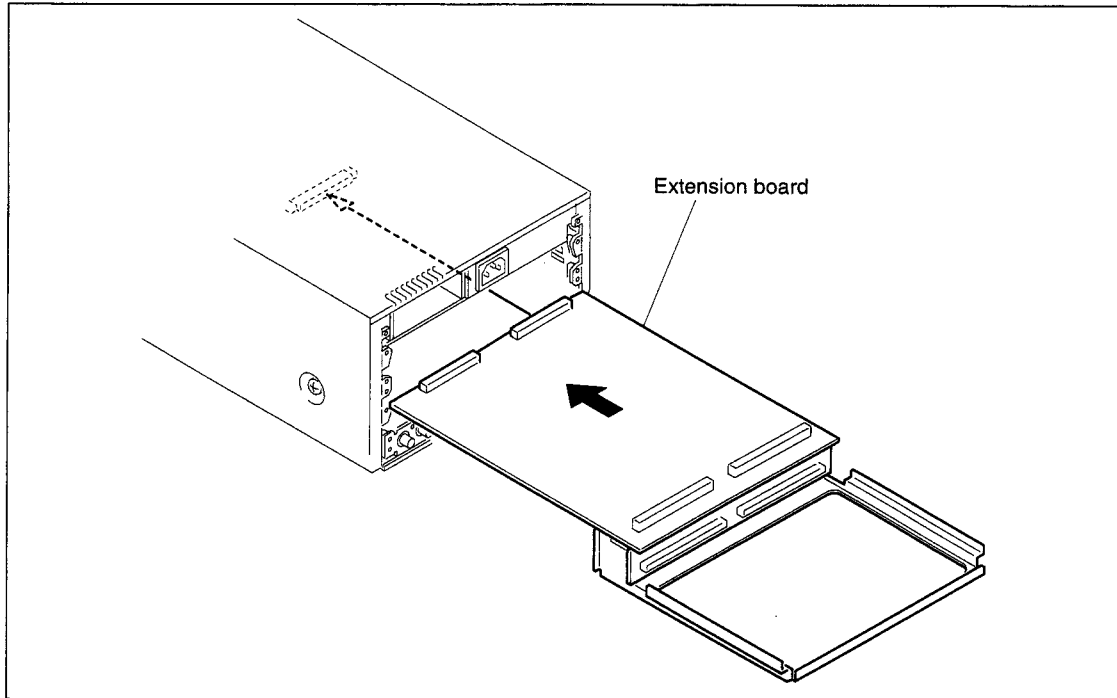
Extension board

In case of horizontal extension
1. Remove the rear panel. (Refer to Section 3-7-1.)
2. Attach the board to be extended to the extension board horizontally as shown below.

SSS-10 board
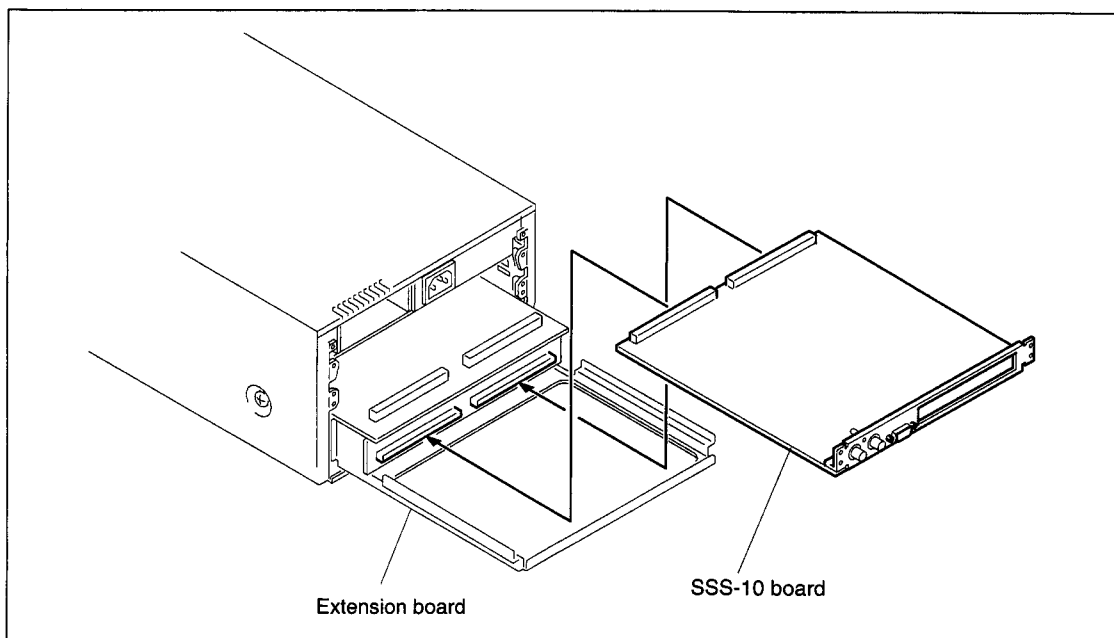
Extension board

In case of vertical extension

1. Remove the rear panel. (Refer to Section 3-7-1.)
2. Attach the board to be extended to the extension board vertically as shown below.

SSS-10 board
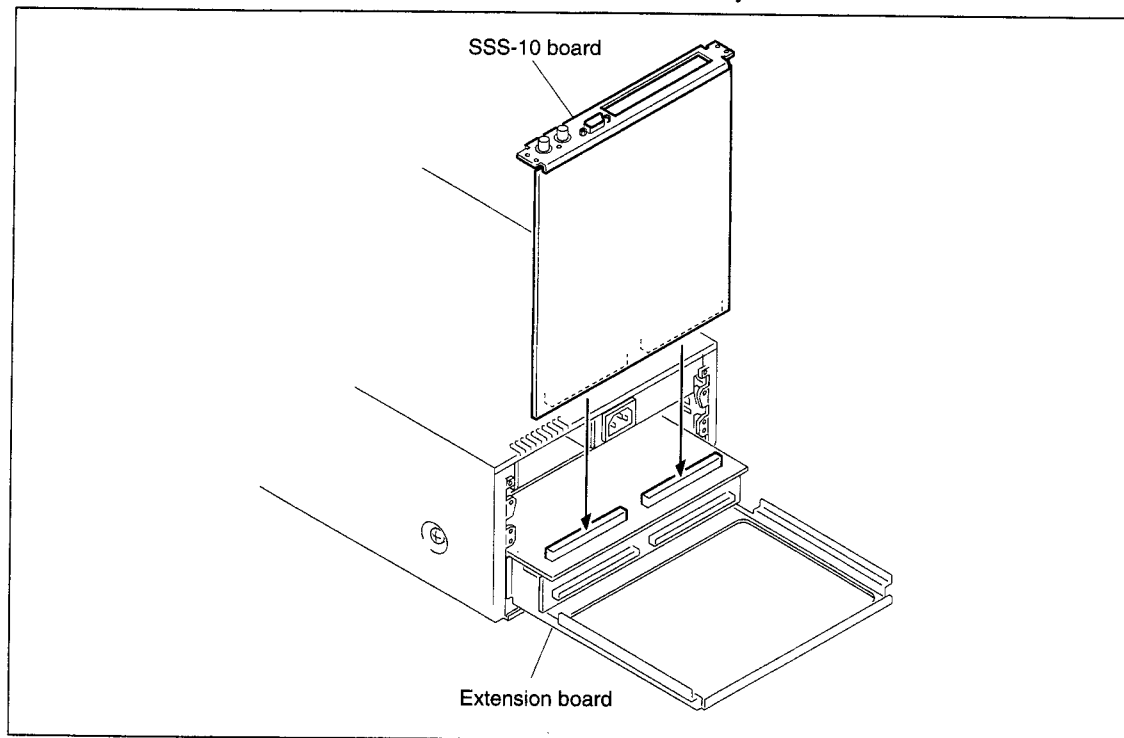
Extension board

In case of inserting into the bottom slot

1. Remove the rear panel. (Refer to Section 3-7-1.)
2. Put the table (at least 50 mm in thickness) under the main unit.
3. Attach the extension board to the main unit as shown below.

Table

Extension board
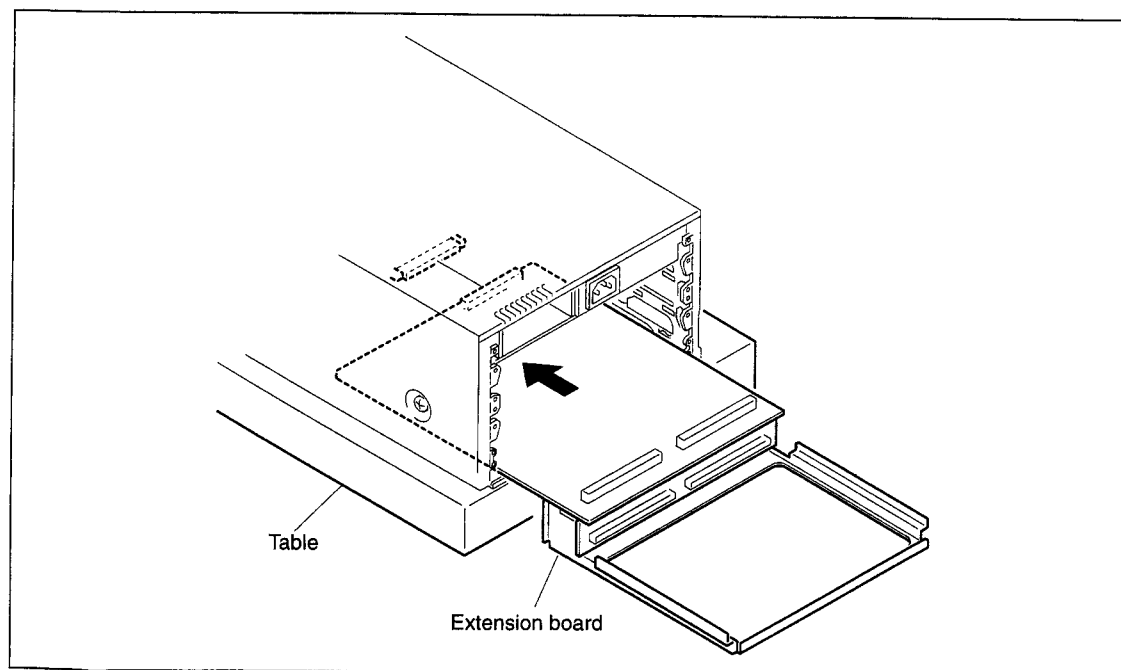
3-7-4. Installing/Removing the Option Boards

Note

When attaching the option boards, be sure to turn off the main power.

Installing/Removing the SDI-58 Board (DSBK-1501)

1. Remove the rear panel. (Refer to Section 3-7-1.)

   Note

   When the DSBK-1503 is already installed, remove the seven screws and remove the rear panel.
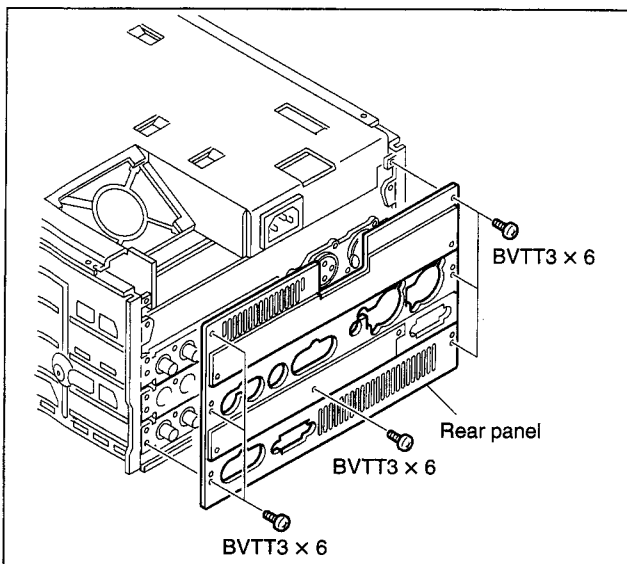
BVTT3 × 6

Rear panel

BVTT3 × 6

BVTT3 × 6

2. Remove the SSS-10 board. (Refer to Section 3-7-1.)
3. Remove the DVP-19 board.
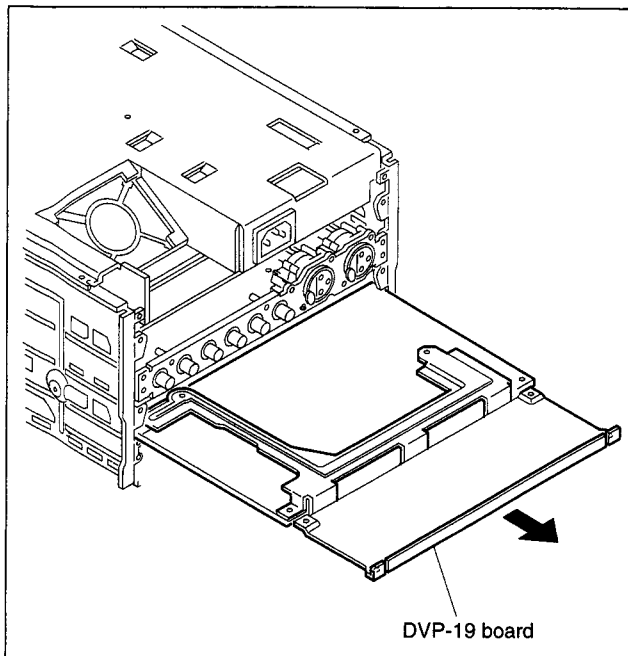
DVP-19 board

4. Securely connect the two connectors (CN101, CN102) on the SDI-58 board to the connectors on the DVP-19 board.
5. Fix the SDI-58 board with the two screws (B3 × 6).

B3 × 6

CN102

DVP-19 board

CN101

SDI-58 board
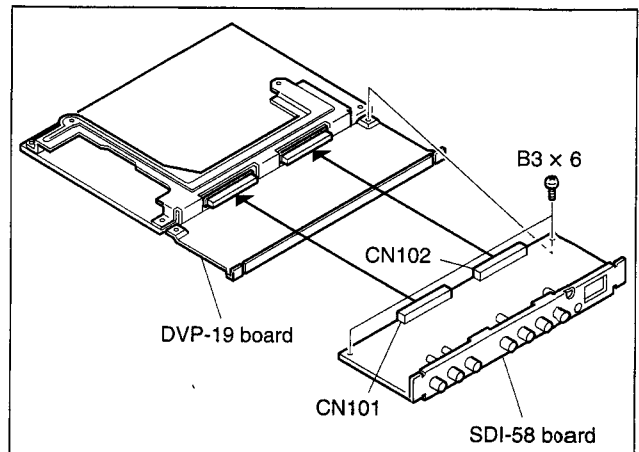
Note

When the DSBK-1503 is already attached, remove the CN-2103 board from the connector adapter and attach the board to the rear panel of the DSBK-1501.

6. Insert the DVP-19 board to the specified slot and securely connect the board to the motherboard.
7. Insert the SSS-10 board to the specified slot and securely connect the board to the motherboard.
8. Remove the two screws and remove the blank panel from the rear panel.

Rear panel

Blank panel   BVTT3 × 6
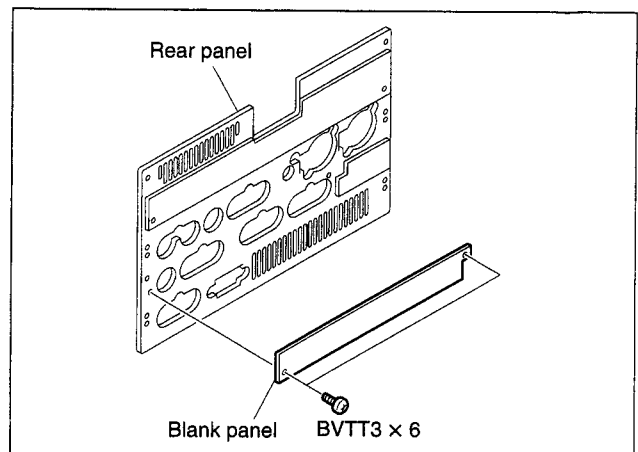
9. Attach the rear panel with the six screws (BVTT3 × 6).
10. Remove the parts in reverse order of the installing procedure.

Installing/Removing the CN-2103/DV-25 Board (DSBK-1503)

1. Remove the rear panel. (Refer to Section 3-7-1.)
2. Remove the SSS-10 board. (Refer to Section 3-7-1.)
3. Remove the DVP-19 board.
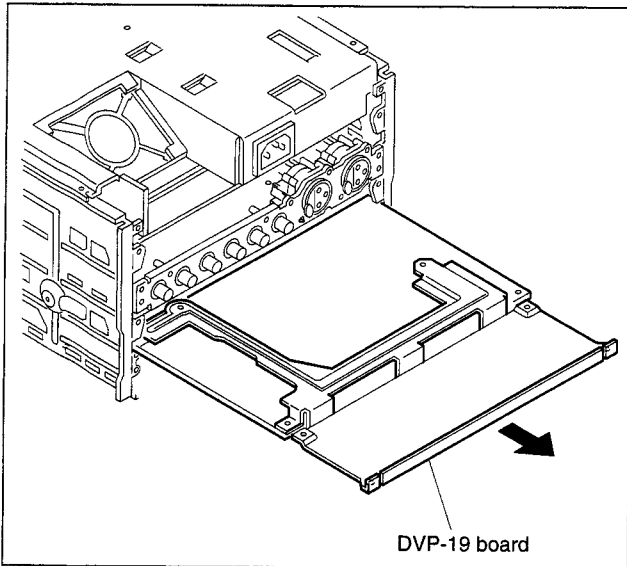
DVP-19 board

4. Securely connect the two connectors (CN51, CN52) on the DV-25 board to the connectors on the DVP-19 board.
5. Fix the DV-25 board with the two screws (B3 × 6).

CN52
B3 × 6
CN51
B3 × 6
DV-25 board
DVP-19 board
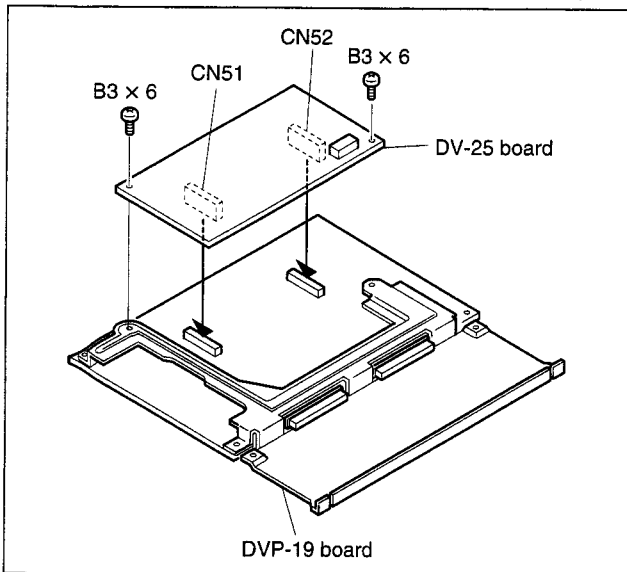
6. Attach the CN-2103 board with the two screws (B2 × 5) to the supplied connector adapter.

| Note |

When the DSBK-1501 is already attached, attach the CN-2103 board to the rear panel of the DSBK-1501 with the two screws (B2 × 5).

7. Connect CN501 on the DV-25 board and CN2 on the CN-2103 board with the supplied harness.

Harness
CN-2103 board
B2 × 5
DVP-19 board
Connector adapter
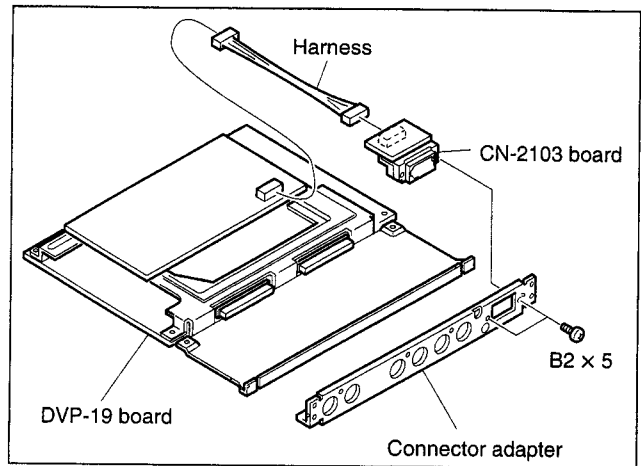
8. Insert the DVP-19 board to the specified slot and securely connect the board to the motherboard.
9. Insert the SSS-10 board to the specified slot and securely connect the board to the motherboard.
10. Remove the screw and remove the blank panel from the rear panel.

Rear panel
Blank panel
BVTT3 × 6
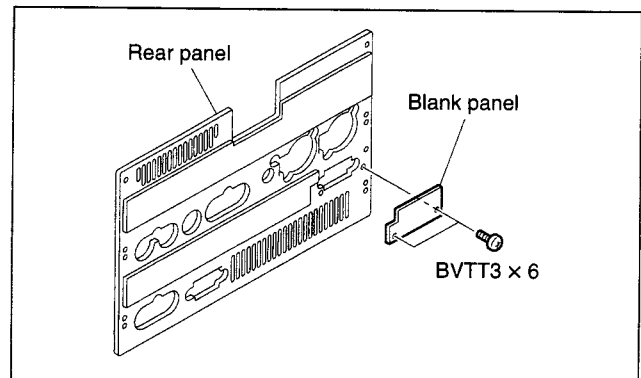
11. Attach the rear panel with the seven screws (BVTT3 × 6).

BVTT3 × 6
Rear panel
BVTT3 × 6
BVTT3 × 6
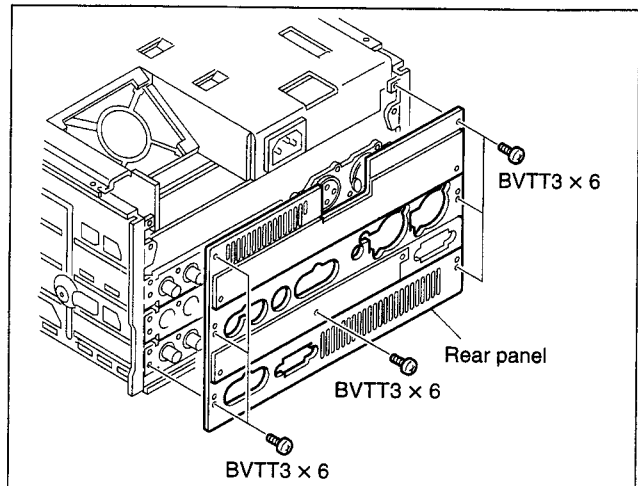
12. Remove the parts in reverse order of the installing procedure.

DSR-1500/1500P

3-8. Notes on Repair Parts

3-8-1. Flexible Card Wire Replacement

The following six types of flexible card wire are used in the DSR-1500/1500P.

Note

Take utmost care when handling the flexible card wires because their life is extremely shortened by folding.

< Type A >

Removing method
Raise the portion marked "**A**" of the connector and release the lock. Pull out the flexible card wire.

Insertion method
Insert the flexible card wire fully up to the marked line and push up the portion marked "**A**" of the connector.
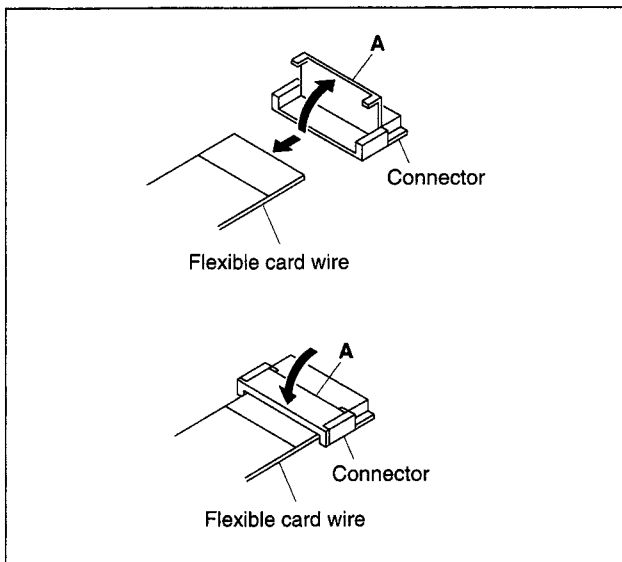
Note

The flexible card wire has the conduction side and the insulation side. Connect the flexible card wire after checking for the correct side as shown.
If the condition side and the insulation side are connected in the wrong direction, the circuit will not operate.

< Type B >

Removing method
Raise the portion marked "**A**" of the connector and release the lock. Pull out the flexible card wire.

Insertion method
Insert the flexible card wire fully up to the marked line and push up the portion marked "**A**" of the connector.
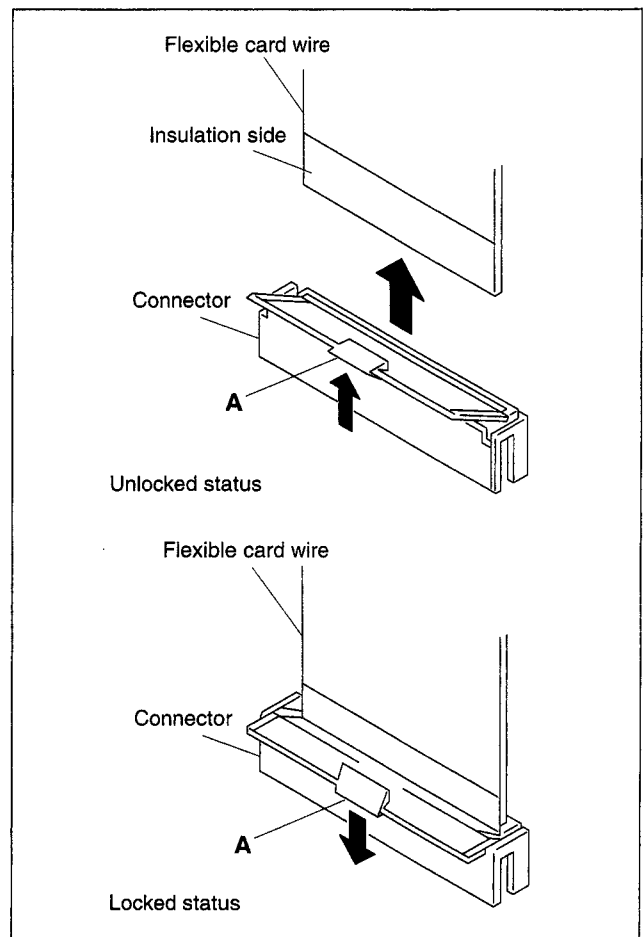
Note

The flexible card wire has the conduction side and the insulation side. Connect the flexible card wire after checking for the correct side as shown.
If the condition side and the insulation side are connected in the wrong direction, the circuit will not operate.

< Type C >

Removing method

Raise the portion marked "**A**" of the connector and release the lock. Pull out the flexible card wire.

Insertion method

Insert the flexible card wire fully up to the marked line and push up the portion marked "**A**" of the connector.

Flexible card wire

Insulation side

A

Connector

Unlocked status

Flexible card wire

A

Connector

Locked status

A
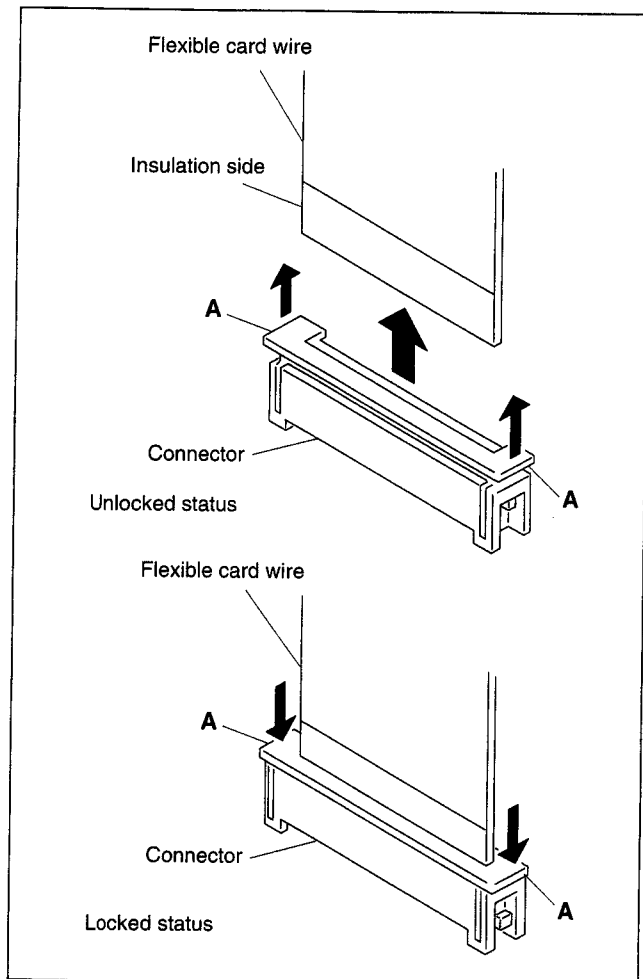
Note

The flexible card wire has the conduction side and the insulation side. Connect the flexible card wire after checking for the correct side as shown.
If the condition side and the insulation side are connected in the wrong direction, the circuit will not operate.

< Type D >

Removing method

Notes

- Do not pull the flexible card wire before releasing the lock.
- The flexible card wire has the conduction side and the insulation side. Check the conduction side and the insulation side before disconnection.

1. Move the portion "**A**" of the connector in the direction of the arrow A to release the lock. Remove the flexible card wire.

Insertion method

Notes

- Confirm that the contacting surface of the flexible card wire is free from stain and dust.
- Confirm that the lock of the connector is already released.

1. Insert the flexible card wire securely to the deep end.
2. Push in the portion marked "**A**" of the connector in the direction of the arrow to lock the connector. Be careful that the flexible card wire is not slanted with respect to the connector.

Flexible card wire

A

Connector

Unlocked status

Flexible card wire

A

Locked status

A

< Type E >

Removing method
Notes
- Do not pull the flexible card wire before releasing the lock.
- The flexible card wire has the conduction side and the insulation side. Check the conduction side and the insulation side before disconnection.

1. Move the portion "**A**" of the connector in the direction of the arrow A to release the lock. Remove the flexible card wire.

Insertion method
Notes
- Confirm that the contacting surface of the flexible card wire is free from stain and dust.
- Confirm that the lock of the connector is already released.

1. Insert the flexible card wire securely to the deep end.
2. Push in the portion marked "**A**" of the connector in the direction of the arrow to lock the connector. Be careful that the flexible card wire is not slanted with respect to the connector.

Connector

A

A

Flexible card wire

Unlocked status

Connector   A

A

Flexible card wire

Locked status

< Type F >

Removing method
Notes
- Do not pull the flexible card wire before releasing the lock.
- The flexible card wire has the conduction side and the insulation side. Check the conduction side and the insulation side before disconnection.

1. Move the portion "**A**" of the connector in the direction of the arrow A to release the lock. Remove the flexible card wire.

Connector

A

A

Flexible card wire

Unlocked status

Insertion method
Notes
- Confirm that the contacting surface of the flexible card wire is free from stain and dust.
- Confirm that the lock of the connector is already released.

1. Insert the flexible card wire securely to the deep end.
2. Push in the portion marked "**A**" of the connector in the direction of the arrow to lock the connector. Be careful that the flexible card wire is not slanted with respect to the connector.

Connector

A

A

Flexible card wire

Locked status

3-9. Replacement of Lithium Battery

The SSS-10 board has the built-in lithium battery as the countermeasure for power failure. The lithium battery is attached on top of IC600 (F-4). Life of the lithium battery is about 6 years.
Time to exchange the battery is displayed in the time counter display block and on the monitor display. Replace the battery when the following message appears.

```
PLEASE EXCHANGE THE
BATTERY TO A NEW ONE.

PLEASE CONTACT SERVICE.
```

Time counter display block

```
Exchg Batt!
```

Sony part number :   1-528-749-11
Type :   M4Z28BR00SH1

Backup battery replacement procedure

Note

When replacing the battery, insert the replacement battery with the "+" and "−" ends correctly oriented. If the battery's positive (+) and negative (−) terminals are backward, physical injury or damage to peripheral equipment can be result due to explosion and or leakage of internal materials.

1. Remove the SSS-10 board. (Refer to Section 3-7-1.)
2. Insert tip of a flat head (−) screwdriver in between the battery and IC600, and remove the battery.
3. Attach the replacement lithium battery so that the protrusion of the lithium battery is directed in the arrow direction as shown, and the battery is firmly secured by the four claws.
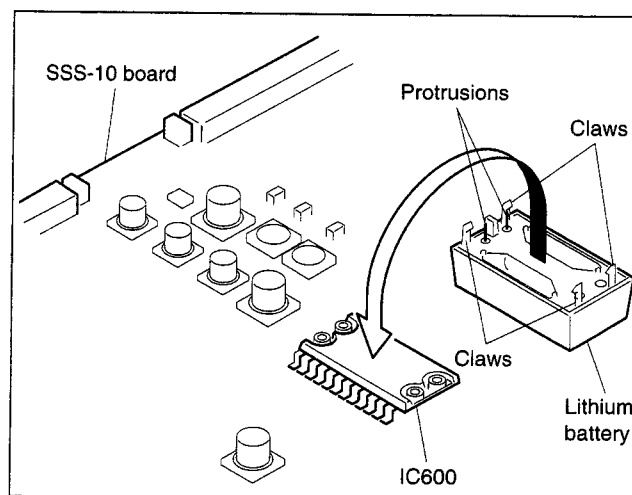
3-10. Fixtures and Tools list

Fig.	Part No.	Description	Uses
①	J-6080-029-A	Small adjustment mirror	Video tracking adjustment
②	J-6082-231-A	Washer mounting fixture (ø1.5)	Parts replacement
③	J-6082-232-A	Washer mounting fixture (ø1.2)	Parts replacement
④	J-6082-233-A	Washer mounting fixture (ø0.8)	Parts replacement
⑤	J-6082-234-A	Washer extracting fixture A	Parts replacement
⑥	J-6082-236-A	Washer fixture kit	Parts replacement (Set of No.2 to No.5)
⑦	J-6082-362-A	Tape guide adjustment driver	Tape guide height adjustment
⑧	J-6082-373-A	Torque cassette	FWD/REV winding torque adjustment
⑨	J-6325-110-A	Torque screwdriver's bit (M1.4)	Parts replacement
⑩	J-6325-380-A	Torque screwdriver's bit (M2)	Parts replacement
⑪	J-6325-400-A	Torque screwdriver (3 kg)	Tightening screws
⑫	J-6443-710-A (CCW)	Brake torque gauge (CCW) (DJ-371)	Brake torque adjustment
⑬	J-6443-720-A (CW)	Brake torque gauge (CW) (DJ-372)	Brake torque adjustment
⑭	J-6444-950-A	Extension board (DJ-495)	Extension board for DSR-1500/1500P
⑮	J-6444-610-B	Path adjustment board (DJ-461)	For tape path adjustment RF envelope detector fixture
⑯	J-6444-720-A	Path adjustment board connection cable (DJ-472)	Tape path adjustment for DSR-1800/1800P/ 1600/1600P/1500/1500P
⑰	3-184-527-01	Cleaning cloth	Cleaning
⑱	7-432-114-11	Locking compound	Locking compound
⑲	7-662-001-39	Grease SG-941(20g)	Parts replacement
⑳	8-967-999-02	Alignment tape XH2-1AST	Tape path alignment (NTSC & PAL)
㉑	8-967-999-22	Alignment tape XH5-1A2 (NTSC)	Audio/video alignment (DVCAM)
	8-967-999-26	Alignment tape XH5-1AP2 (PAL)	Audio/video alignment (DVCAM for PAL)
㉒	8-967-999-31	Alignment tape XH4-1A (NTSC)	Audio/video alignment (DV)
㉓	9-919-573-01	Cleaning fluid	Cleaning
㉔	J-6444-970-A	System control/Servo download tool board (DJ-497)	Software version-up
㉕	J-6444-990-A	FPGA download tool board (DJ-499)	Software version-up
㉖	J-6445-000-A	Path tool power supply cable (DJ-500)	Tape path adjustment for DSR-1500/1500P

① ② ③ ④ ⑤ ⑥

⑦ ⑧ ⑨ ⑩ ⑪

⑫ ⑬ ⑭ ⑮

⑯ ⑰ ⑱ ⑲

⑳ ㉑ ㉒ ㉓ ㉔ ㉕

㉖
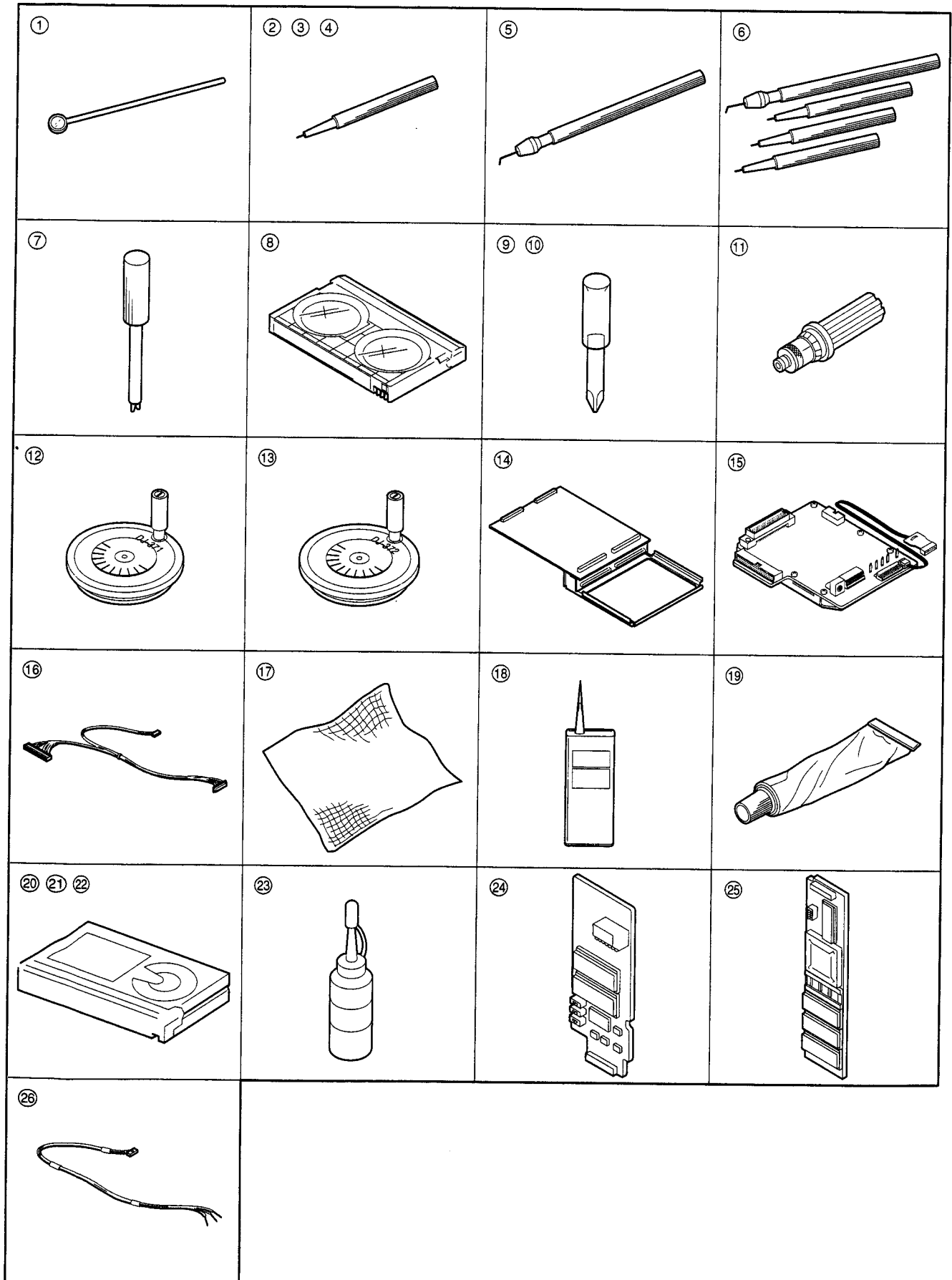
3-11. Upgrading the System/Servo CPU Program Version

The DSR-1500/1500P mounts the CPU for SY and SV on the SSS-10 board and uses flash ROMs for loading this program.
Do the following procedure to upgrade the version of the flash ROMs mounted on the board.
There are two methods of the upgrading the flash ROMs.
(1) High-speed writing using the fixture board, J-6444-970-A (DJ-497)
(2) Writing by downloading from a PC (through RS-422)

3-11-1. Upgrading the Version Using the Fixture Board

1. Setting the fixture board DJ-497
Write the CPU software to be written into the following PROMs.
　ROMs to be used on the fixture DJ-497
　　　SV CPU　　MX27C2000DC-12 (8-759-477-94) or equivalent
　　　SY CPU　　M27C4001-10F1-(G) (8-759-568-73) or equivalent
As these CPUs employ 16 bits data bus, 2 pieces of PROMs are required for one CPU.
Write softwares into PROMs in the 8 bit split mode. A PROM at even address side is for CN102.
A PROM at odd address side is for CN101.

(1) Insert the PROMs, in which CPU software are written, into the socket on the fixture board DJ-497.
(2) Set bit 1 of S1 on the fixture DJ-497 to OPEN (upper side) and the rest of bits to the board side (lower side).
(3) Set S3 on the fixture DJ-497 to $\boxed{\text{ROM}}$ side and S2 on the fixture DJ-497 to $\boxed{\text{DOWN}}$ side.
(4) Set S4 on the fixture DJ-497 to $\boxed{\text{8M}}$ (at the SY CPU) or set to $\boxed{\text{4M}}$ (at the SV CPU).

2. How to upgrade

(1) Remove the top panel of the unit. (Refer to Section 3-3, "Removing/Installing the Cabinets".)

(2) Extend the SSS-10 board with the extension fixture board DJ-495. (Refer to section 3-7-3, "Installing the Extension Board " for installation of the extension fixture board.)

(3) Connect the fixture board DJ-497, in which the PROMs of the CPU software to be written are installed, as shown in the following figure.

CPU of software to be written	Target board to which DJ-497 is connected
SY CPU (IC501/SSS-10)	CN1/SSS-10
SV CPU (IC202/SSS-10)	CN2/SSS-10

When re-writing the SY CPU   When re-writing the SV CPU
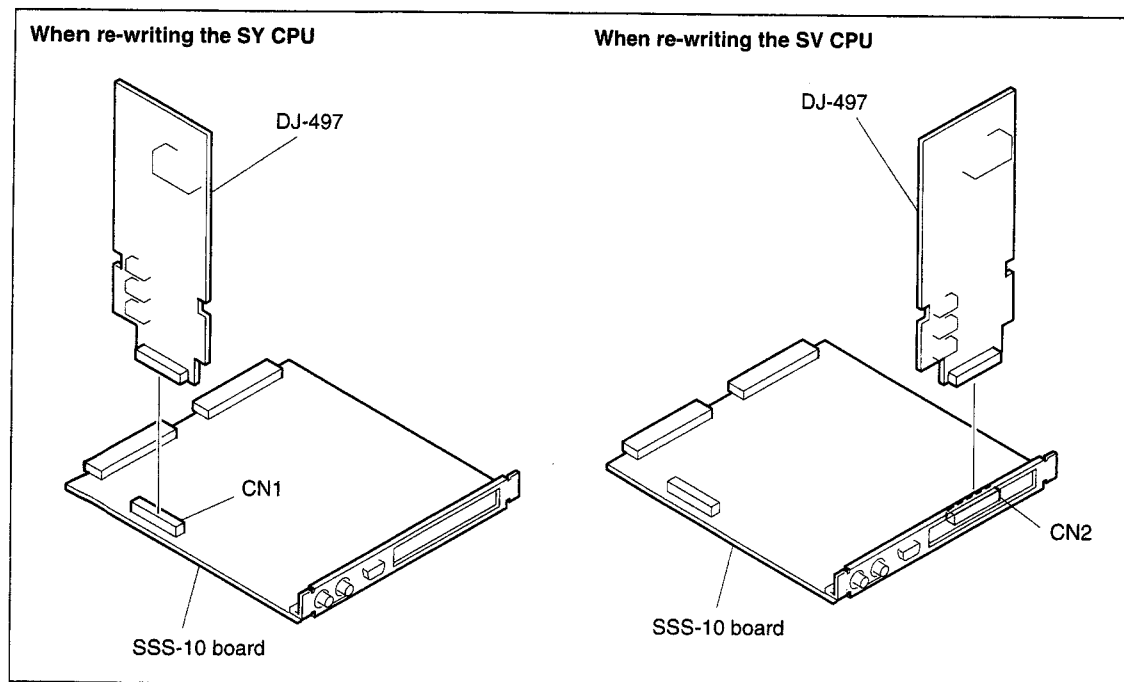
(4) Turn on the power of the set. Then, writing starts.
   While writing is being executed, the LEDs of the fixture DJ-497 show the status shown below.
   D2 lights up.   ERASE is being executed.
   D2 and D4 light up.   BLANKCHECK is being executed.
   D3 lights up.   COPY is being executed.
   D4 lights up.   VERIFY is being executed.

(5) When only D5 (green LED next to three red LEDs) lights up, writing ends.
   D5 lights up.   Normal termination
   D1 lights up.   Abnormal termination
                            (Suspect the cause of abnormality judging from status of LEDs
                            other than the above ones.)

(6) Turn off the power switch of the unit and remove the fixture board.

(7) Turn on the power switch of the unit again and confirm the PROM version on the maintenance menu.
   (For checking procedure, refer to Section 5, "Maintenance Menu".)

3-11-2. Version Upgrade from a PC through RS-422

1. Preparation

To convert the RS-232C of a PC to RS-422 (9 pin), use a conversion box or conversion board available on the market.

1) Install the version upgrade application software (fup.exe) on the PC on which Windows95 or 98 is installed.
2) Download the version upgrade software of CPUs to be upgrade.

2. How to use fup.exe

Start up the fup.exe and then the main dialogue menu shown below appears.
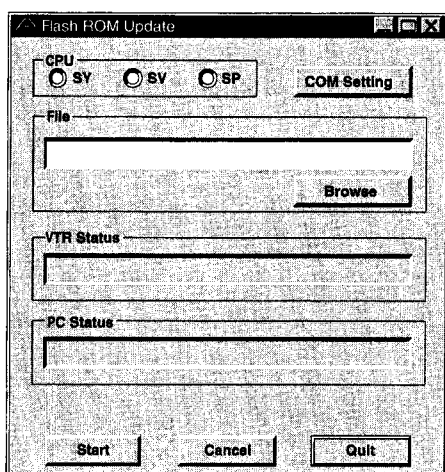
Main Dialogue
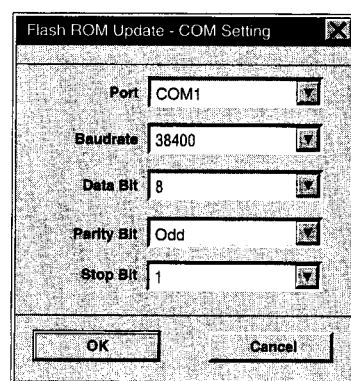
Communication Setting Dialogue

The details of each button are as follows.

CPU :	Select one of SY and SV.
	(Designate a target CPU to be transferred.)
COM Setting :	The communication setting dialogue appears.
	(DO NOT assign items other than Port.)
File :	Enter a hex filename to be transferred in this field.
	When a filename is selected using Browse, the selected filename appears.
	Drag & Drop is supported.
Browse :	The file selection menu appears.
VTR Status :	The message from a VTR appears in this field.
PC Status :	This field shows a status such as "FINISH",
Start :	The file transfer to a VTR is started. (Unless a filename is designated, it is invalid.)
Cancel :	The file transfer to a VTR is stopped.
Quit :	Flash ROM Update is terminated.

3. Operation

Operate in the order of "Select CPU." → " Designate hex.filename to be transferred." → "Press Start button.".

After the version upgrade is completed, turn off and on the power of the VTR.
(In case of upgrading the same CPU or other CPU, it is not necessary to power down.)
When it is properly finished, confirm the PROM versions on the maintenance menu.
(For checking procedure, refer to Section 5, "Maintenance Menu".)
During transferring, the status is displayed in between "PC Status" and " Start, Cancel and Quit buttons".
The progress bar and the remaining time are displayed.

Messages
VTR Status

Displayed messages	Contents	Details
Download completed	Completed download.	
Flash memory erasing	Erasing flash memory.	
Flash memory writing	Writing flash memory.	
Flash memory access failure	Unable to access to flash memory.	Flash ROM device error, Writing error
Flash memory erase failure	Unable to erase of flash memory.	Flash ROM erasure error
Verify error	Verify Error occurs.	Verify-error in writing into flash memory
Checksum error	Checksum error occurs.	Checksum error in data received from a PC
Communication error between VTR and PC	Communication error occurs in VTR and PC.	Overrun, flaming, parity error

PC Status

Displayed messages	Contents	Details
Communication establishment with VTR	Trying communication with a VTR.	Starts at the pressing the Start button and ends until VTR starts to erase flash memory.
Communication stop with VTR	Communication with a VTR is stopped.	A user pressed Cancel button.

Message Box

Displayed messages	Contents	Details
There is not the response from VTR	No response from a VTR	
VTR it was not made to a remote mode	Can't set a VTR to remote mode.	
VTR it was not made to an adjustment mode	Can't set a VTR to adjustment mode.	
VTR it was not made to a download mode	Can't set a VTR to download mode.	
File open error	File not found.	When Start button is pressed, if a file is not found.
Port open error	Can't open a port.	When Start button is pressed, RS-232C COM port does not open.
VTR the communication discontinuation before download completed	A VTR interrupts communication.	Before transfer finishes, a VTR finishes.

VFD Display

Displayed messages	Details
loading XX (XX : SY, SV)	Now loading.
complete!	Download is completed without fail.
incomplete!	Download is abnormally terminated.
Error91-130	SY flash ROM is abnormal. (Valid only in download mode.)
Error91-430	SV flash ROM is abnormal. (Valid only in download mode.)
Error91-215	Waiting for data sent from a PC. (Communication error between SY and KY) Power down a VTR once.

Monitor

```
ALARM
Now upgrading.

After version upgrade
power down once.
```
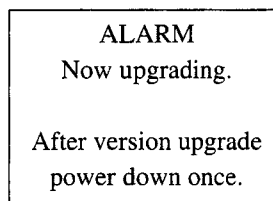
3-12. Upgrading the FPGA Program Version

The DSR-1500/1500P mounts the FPGA (field programmable gate alley) on the process board and uses flash ROMs for loading this program.
The version of these flash ROMs mounted on the board can be upgraded using the following method.

3-12-1. Setting of DJ-499

The switch setups are different according to the program file to be written. Set the switches as shown in the following table.

Model name	Board name	Connect to DJ-499	PROM file name	Switch setting of DJ-499 S3
DSR-1500/ 1500P	DVP-19	CN4	SIF-00/01/02	
		CN5	FU-00/01/02/03	

(∎ indicate the knob position.)

3-12-2. Upgrading the Version

(1) Prepare the fixture board DJ-499 (J-6444-990-A).
(2) Write the required number of rewrittable program files in the PROM (M27C1001-70F1 (F8) (8-759-58-91) or equivalent). Refer to the following for the number required.
(3) Mount the PROMs in order from the one with the smallest number to the DJ-499 ref. No. 100 to 103.
(4) Set the DJ-499 while referring to Section 3-12-1.
(5) With the power of the unit set to OFF, mount the DJ-499 as show in the following figure.

When re-writing the SIF-00/01/02

DJ-499

CN4

DVP-19 board

When re-writing the FU-00/01/02/03

DJ-499

CN5

DVP-19 board
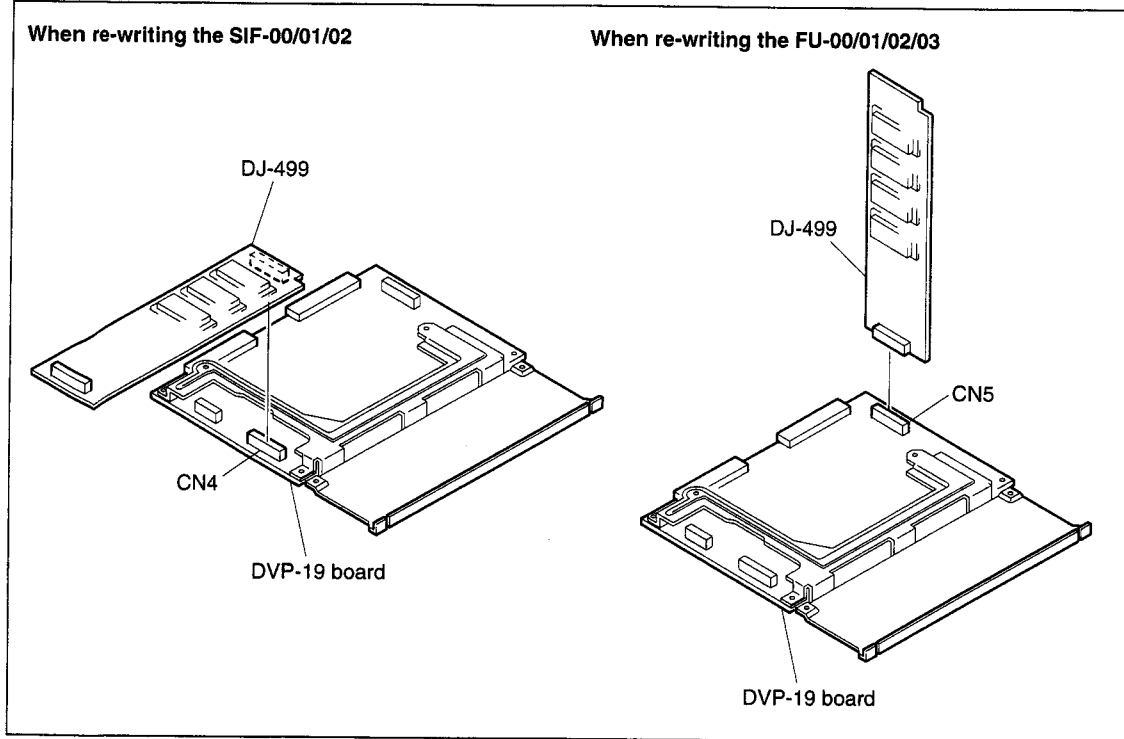
(6) Turn ON the power of the unit.
- Of the three LEDs on the DJ-499, the green D1 at the end lights up and goes off.
  (The dummy data will be loaded in the FPGA. It will be completed when D1 goes off.)
- The same green D1 will blink after a while.
  (The flash ROM on the board is erased and new data is downloaded.)
- It stops blinking, and the green D2 in the middle lights up, meaning that upgrading has ended normally.
- If the red D3 in the middle lights up halfway through, it means that a writing error has occurred. Check if the DJ-499 is connected properly, and perform step (6).

Section 4
Error Messages

4-1. Alarm Display

This unit has an alarm display function.

When a problem is detected, an alarm is displayed immediately in the timer counter block. The alarm and a message describing the countermeasure are displayed on a video monitor connected to the B-Y/CPST (SUPER) connector.

This unit has two types of alarms : one is for operators while the other is for service persons. This manual describes only the alarms for service persons. For details of alarms for operators, refer to the operating instruction or overview in this manual. Activating the alarm display may influence the system, such as when the reference video signal is not used. Therefore, you can select whether or not to display the alarm from the Setup menu selection. As for Setup menu, refer to Section 1 of this manual or to the operating instruction. However, the alarms for service persons are displayed regardless of the Setup menu setting.

4-1-1. Alarm Display when the Main Power is Turned On

Detection :   The cassette compartment is not attached, or the harness is not connected to the cassette compartment.

Operation after detection : None

Display :   The alarm is displayed until any key is pressed.


```
        ALARM

  CASS-COMPARTMENT
     MALFUNCTION.

    CHECK CABLE.
```
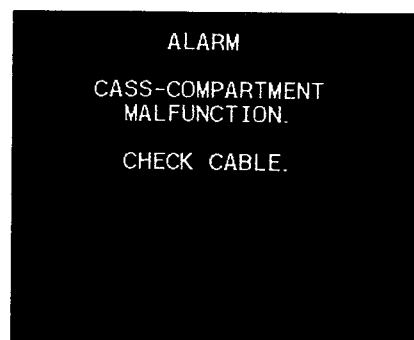
```
CAS-COM Err
```

Detection :   Checks the settings of switch S400-5 to 8 on the SSS-10 board and the contents of non-volatile memory (EEPROM).

Operation after detection : None

Display :   The alarm is displayed until any key is pressed.

For UC

```
        ALARM

   SETTING HAS BEEN
      CHANGED TO
   DSR-1500   NTSC(UC)


   CHECK THE S400-5~8
  SWITCH ON THE SS BOARD.
```

```
VTR Change!
```

For CE

```
        ALARM

   SETTING HAS BEEN
      CHANGED TO
   DSR-1500   PAL


   CHECK THE S400-5~8
  SWITCH ON THE SS BOARD.
```
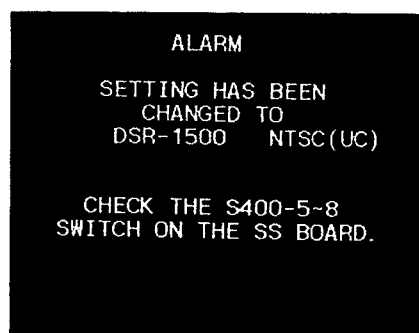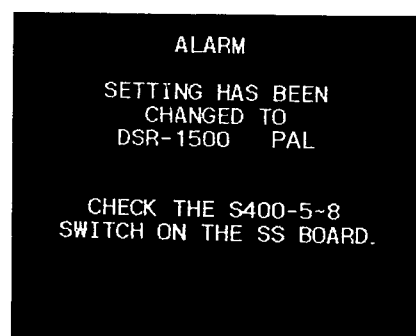
```
VTR Change!
```

Detection :	Checks the version of the Setup menu.
Operation after detection :	The Setup menu operates using the factory settings. The contents of the non-volatile memory (EEPROM) remain unchanged. Therefore, if the setting of the Setup menu is not changed, the same alarm will appear when the main power is turned on.
Display :	The alarm is displayed until any key is pressed.

```
        ALARM

  THE SETUP MENU SOFTWARE
     HAS BEEN UPGRADED.

  SET THE SETUP MENU ITEMS
  TO THE DESIRED SETTINGS
  OR ACTIVATE THE 'LOAD
  MENU DATA ' (MAINTENANCE
  MENU) FUNCTION.
```

```
MENU Ver. UP
```
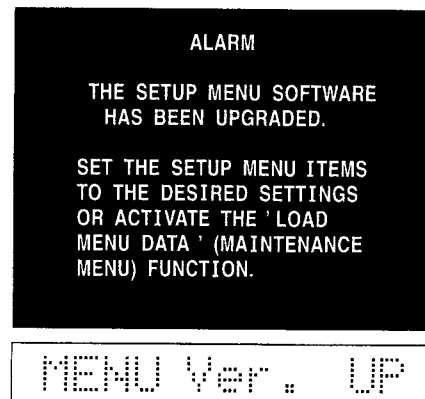
Detection :	Checks that switch S400-1 to 4 on the SSS-10 board is set to ON.
Operation after detection :	None
Display :	The alarm is displayed until any key is pressed.

```
        ALARM

    THE UNIT IS IN
   ADJUSTMENT MODE.

  SET THE SWITCHES OF
  S400-1~4 ON THE
  SS BOARD TO OFF.
```

```
ADJ. mode!
```
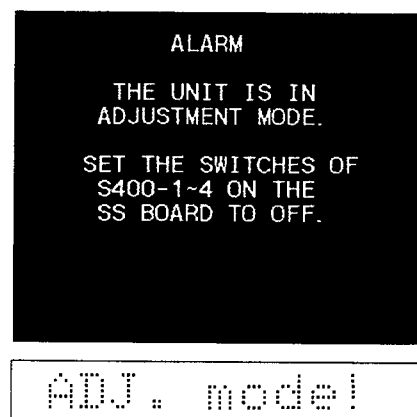
Detection :	Checks that the FACTORY USE item of the Setup menu is changed.
Operation after detection :	None
Display :	The alarm is displayed until any key is pressed.

```
        ALARM

  SELECTIONS OF THE SETUP
   MENU'S FACTORY USE
  ITEMS HAVE BEEN CHANGED.

    SET THESE ITEMS TO
  FACTORY PRESET VALUES.
```

```
FACT. USE!
```
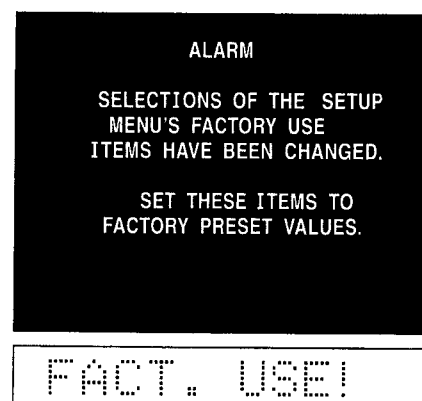
4-2. Error Codes

This unit has a self diagnostics function which detects internal abnormalities. When a problem is detected, an error code is displayed immediately in the time counter block, and details of the error appear on the video monitor connected to the B-Y/CPST (SUPER) connector.

| Note |

An error code appears in the column shown by XX-XXX on the display.

```
           ERROR

      AN ERROR HAS BEEN
   DETECTED. INFORM SERVICE
     OF FOLLOWING CODE:
           XX-XXX

       PRESS EJECT KEY
       TO EJECT TAPE.
```

```
Error  XX-XXX
```

When detected, some errors turn the unit to AUTO OFF. (Refer to Section "4-2-3. Error Codes," excluding error code 08-032.)

This error is kept in memory even after the main power of this unit is turned off. In other words, the error code or the contents of the detected error appear even when the main power of this unit is turned off and then back on again, so this unit enters AUTO OFF mode again.

This unit enters the emergency EJECT mode when the | EJECT | key is pressed at this moment.

| Reference |

In the emergency EJECT mode, the tape is ejected gently by usable motor assuming that the tape is slack or a device may be faulty.

The following message appears on the video monitor connected to the B-Y/CPST (SUPER) connector when this unit enters the emergency EJECT mode.
The error code is displayed on the time counter.

```
           ERROR

   TAPE IS BEING EJECTED.
       WAIT UNTIL THIS
     INDICATION GOES OFF.
```

The message shown to the right appears on the video monitor connected to the B-Y/CPST (SUPER) connector when a cassette tape is ejected in the emergency EJECT mode.
The error code is displayed on the time counter.

```
              ERROR

         AN ERROR HAS BEEN
      DETECTED. INFORM SERVICE
         OF FOLLOWING CODE:
              XX-XXX
```

The message shown to the right appears on the video monitor connected to the B-Y/CPST (SUPER) connector when a cassette tape cannot be ejected with the emergency EJECT mode.
The error code is displayed on the time counter.

```
              ERROR

      TAPE CANNOT BE EJECTED.
           INFORM SERVICE
         OF FOLLOWING CODE:
              XX-XXX
```

Perform Section "4-3-1. How to Take Out the Cassette Whose Tape is Slacked (MANUAL EJECT) " when a cassette tape cannot be ejected with the emergency EJECT mode.

4-2-1. Display of Previously Detected Error Codes

When the DSR-1500/1500P detects an internal abnormality, the error code is memorized in EEPROM.
(Excluding error code 9X-XXX)
A maximum of 8 error codes detected previously, starting from the latest error code, can be displayed.

How to display the error code

1. While pressing the ◀ key, press the MENU key.

```
           MAINTENANCE MENU
      MENU DATA CONTROL    →
      EDIT CHECK
      SERVO CHECK
      SERVO ADJUST
      TAPE PATH ADJUST
      ELECTRICAL ADJUST
      SERVICE SUPPORT
      OTHERS
```

2. Move the cursor to SERVICE SUPPORT so that the letters are highlighted using the ▲ , ▼ keys, then press the ▶ key.

```
           MAINTENANCE MENU
      SERVICE SUPPORT
      ← ERROR LOG             →
        MANUAL EJECT

        DIAGNOSTICS CONTROL
```
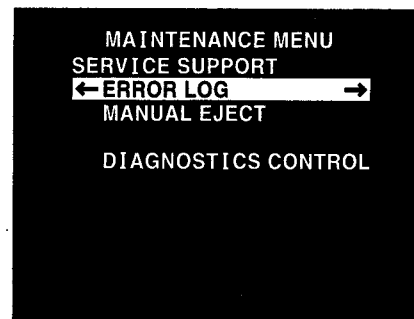
3. Move the cursor to ERROR LOG so that the letters are highlighted using the ▲ , ▼ keys, then press the ▶ key.
   The display changes as shown to the right, and the error log appears.

```
           MAINTENANCE MENU
      SERVICE SUPPORT
          ERROR LOG
      ←    ERROR-08-03A
           ERROR-02-674
           ERROR-02-603
           ERROR-08-03A
           ERROR-02-674
           ERROR-02-603
```

4-2-2. Main Codes and Sub Codes

Main codes

The main code is a two-digit number that indicates the system which sensed the error.

Main code 0X :	Servo and tape path system error
Main code 2X :	Mechanism control system error
Main code 3X :	Sensor error
Main code 91 :	Communication system and interface system error
Main code 92 to 94 :	Sync. system error
Main code 95 :	Digital signal process system error and communication error with ICs

Sub codes

The sub code is a three-digit number. Each digit has the following meaning.

When the Main Code is 0X or 2X :

```
X       X       X
|       |       |
|       |       Third digit : Abnormal symptom
|       Second digit : Device which senses abnormality
First digit : Mode which senses abnormality.
```
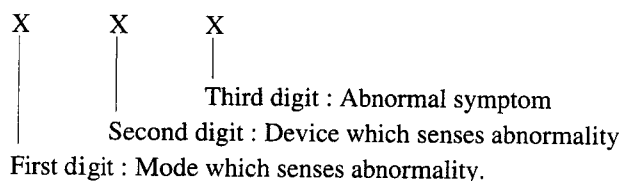
First digit : Mode which senses abnormality.

0 : Mode cannot be identified, or mode identification is
     not necessary.
1 : Cassette down mode
2 : Threading mode
3 : STOP mode
4 : F. FWD or REW mode
5 : SEARCH mode
6 : PLAY or RECORD mode
7 : STANDBY-OFF mode
8 : Unthreading mode
9 : Cassette up mode
A : Cassette out mode
    (State that a cassette is ejected.)

Second digit : Device which senses abnormality

0 : Device cannot be identified, or device identification is
     not necessary.
1 : Cassette up/down motor/sensor
2 : Threading motor/FG/sensor
3 : Drum motor/FG
4 : Capstan motor/FG
5 : Supply reel motor/FG
6 : Supply reel brake solenoid
7 : Takeup reel motor/FG
8 : Takeup reel brake solenoid
9 : Supply and takeup reel motor/FG
A : Tension regulator
B : Pinch solenoid
C : Reel position motor/sensor
D : Head cleaning solenoid
E : M stop solenoid

Third digit : Abnormal symptom

0 : Abnormal symptom identification is not necessary.
1 : Operation could not be completed within the specified
     time.
2 : Abnormal speed detected.
3 : Tape slack detected.
4 : FG cannot be detected.
5 : FG detected.
6 : Rotating direction error detected.
7 : Excessive tension detected.
8 : Abnormal current detected.
9 : The full top or full end of a tape cannot be released.
A : Retry in progress
    (Unthreading and re-threading)

When the Main Code is 3X :

All sub codes are 000.

When the Main Code is 91 :

X   X   X

                Third digit : Abnormal symptom

      Second digit : CPU (microprocessor) or IC of the
                   communication counterpart.
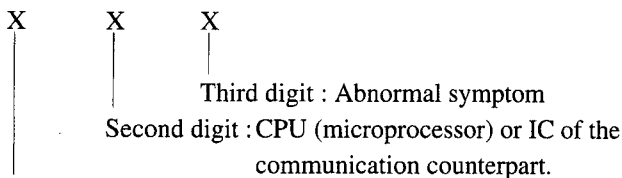
First digit : CPU (microprocessor) or IC which detects the
           abnormality.

First and second digits : CPU (microprocessor) code.

1 : System control main CPU (SSS-10, IC501)
2 : Keyboard u-COM (KY-474, U102)
3 : Memory
4 : Servo main CPU (SSS-10, IC102)
5 : Servo sub u-COM (DR-428, IC1)
7 : SPCON main CPU (SSS-10, IC501)
D : DV I/F u-COM (DV-25, IC602)
E : Digital I/F u-COM (SDI-58, IC903)

Third digit : Abnormal symptom (when the communication counterpart is other than memory)

1 : Abnormal checksum
2 : Abnormality of overrun
3 : Abnormal parity
4 : Abnormal framing
5 : Communication could not be completed in the specified time.

Third digit : Abnormal symptom (when the communication counterpart is memory)

0 : Abnormality of ROM
1 : Abnormality in the external memory area
2 : Abnormality in the internal memory area
3 : Abnormality in the common memory-1 area
4 : Abnormality in the common memory-2 area
5 : Abnormality in the external serial memory-1 area
6 : Abnormality in the external serial memory-2 area
7 : Abnormality in the external serial memory-3 area
8 : Abnormality in the external serial memory-4 area
9 : Abnormality in the EEPROM area
A : Abnormality in the NVRAM area
B : Abnormality in the Hours Meter area
F : Abnormality of MIC

When the Main Code is from 92 to 94 :

X   X   X

                Third digit : Abnormal signal

      Second digit : IC to which the signal is input

First digit : CPU (microprocessor) which detects the
           abnormality
     . . . . . Same as the main code 91
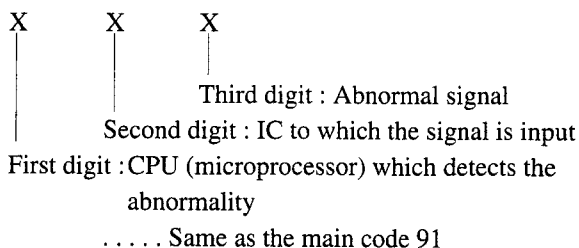
Third digit : Abnormal signal

1 : Reference frame pulse of the output signal (NSG OE)
2 : Reference track pulse of the playback side (P-TRKT)
3 : Reference frame pulse of the playback side (P-FLTT)
4 : Reference track pulse of the record side (R-TRKT)
5 : Reference frame pulse of the record side (R-FLTT)
6 : Reference track pulse of the playback side (P-TRKD)
7: Reference frame pulse of the playback side (P-FLTD)
8: Reference track pulse of the record side (R-TRKD)
9: Reference frame pulse of the record side (R-FLTD)

When the Main Code is 95 :

X   X   X

          Second and third digits :
               IC of the communication counterpart.
               (The second digit indicates the communication line number and the third digit indicates the CS number.)

First digit : CPU (microprocessor) or IC which detects the
           abnormality.
     . . . . . Same as the main code 91
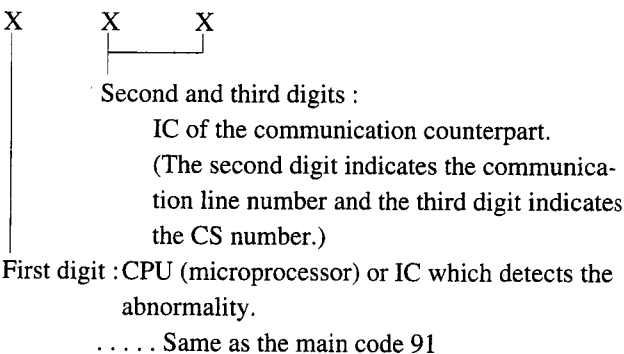
4-2-3. Error Codes

Main code 0X : abnormality of servo and tape path system

① Main code 02

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
058	Detected an abnormal current in the S reel motor.	AUTO OFF	EJECT (Emergency EJECT)	Displayed until the next cassette tape is inserted.
068	Detected an abnormality of reel brake plunger solenoid.			
078	Detected an abnormal current in the T reel motor.			
0B8	Detected an abnormality of pinch plunger solenoid.	Cassette tape insertion and unthreading are prohibited until the error is solved.		Displayed until the error is solved.
154	Failed to detect the S reel FG by the FG check during cassette tape insertion.	Cassette tape will be ejected.	–	Displayed until the next cassette tape is inserted.
174	Failed to detect the T reel FG by the FG check during cassette tape insertion.			
194	Failed to detect both S and T reel FGs by the FG check during cassette tape insertion.			
254	Failed to detect the S reel FG during threading.	AUTO OFF	EJECT (Emergency EJECT)	
255	Detected the S reel FG during threading.			
274	Failed to detect the T reel FG during threading.			
275	Detected the T reel FG during threading.			
291	Failed to complete winding a tape.			
355	Detected the S reel FG during STOP and STILL.			
375	Detected the T reel FG during STOP and STILL.			
395	Detected both S and T reel FGs during STOP and STILL.			
402	Detected an abnormal tape speed during F. FWD and REW.	STOP	The machine operates normally after the error is solved.	
403	Detected slack tape during F. FWD and REW.	AUTO OFF	EJECT (Emergency EJECT)	
454	Failed to detect the S reel FG during F. FWD and REW.			
474	Failed to detect the T reel FG during F. FWD and REW.			
494	Failed to detect both S and T reel FGs during F. FWD and REW.			
496	Detected the abnormal direction of S and T reel rotation during F. FWD and REW.			
503	Detected slack tape during search.			
554	Failed to detect the S reel FG during search.			
574	Failed to detect the T reel FG during search.			
594	Failed to detect the S and T reel FGs during search.			
596	Detected the abnormal direction of S and T reel rotation during search.			
603	Detected slack tape during PLAY and REC.			

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
654	Failed to detect the S reel FG during PLAY and REC.	AUTO OFF	EJECT (Emergency EJECT)	Displayed until the next cassette tape is inserted.
674	Failed to detect the T reel FG during PLAY and REC.			
694	Failed to detect both S and T reel FGs during PLAY and REC.			
696	Detected the abnormal direction of S and T reel rotation during PLAY and REC.			
803	Detected slack tape during unthreading.			
854	Failed to detect the S reel FG during unthreading.			
855	Detected the S reel FG during unthreading.			
874	Failed to detect the T reel FG during unthreading.			
875	Detected the T reel FG during unthreading.			
A55	Detected the S reel FG during cassette eject.	Insertion of a cassette is inhibited until the error is solved.		
A75	Detected the T reel FG during cassette eject.			
A95	Detected both S and T reel FGs during cassette eject.			

② Main code 06

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
3A7	Detected abnomal tape tension during STOP.	AUTO OFF	EJECT (Emergency EJECT)	Displayed until the next cassette tape is inserted.
4A7	Detected abnomal tape tension during F.FWD/REW.			
5A7	Detected abnomal tape tension during SEARCH.			
6A7	Detected the abnormal tape tension during PLAY and RECORD.	The mode at the time of detection is kept continued. (If the mode is PLAY, PLAY continues.) If mode is changed to other than PLAY and RECORD, machine enters AUTO OFF.	The machine operates normally after the error is solved. The PLAY and RECORD modes continue but other modes are changed to STOP then EJECT (Emergency EJECT).	Displayed until the error is solved and any key is pressed.

③ Main code 07

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
042	Detected the abnormal capstan speed.	STOP	The machine operates normally after the error is solved.	Displayed until any key is pressed.
144	Failed to detect the capstan FG by the FG check during cassette tape insertion.	Cassette tape will be ejected.	–	Displayed until the next cassette is inserted.

④ Main code 08

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
03A	Detected the abnormal drum speed. **Video monitor display** ERROR DRUM SPEED ERROR HAS BEEN DETECTED WAIT UNTIL THIS INDICATION GOES OFF.	Retry (The mechanism unthreads once then threads again.)	EJECT	Displayed until the error is solved.
032	The abnormal drum speed error is not solved.	AUTO OFF	EJECT	Displayed until the next cassette is inserted.

⑤ Main code 09

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
010	Detected abnomal position of cassette compartment.	Cassette tape insertion and unthreading are prohibited until the error is solved.		Displayed until the error is solved.
020	Detected an abnormality of threading position sensor.			
028	Detected an abnormal current of threading motor.			
221	Failed to complete threading within the specified time	AUTO OFF	EJECT (Emergency EJECT)	Displayed until the next cassette is inserted.
224	Failed to detect the threading FG during threading.			
821	Failed to complete unthreading within the specified time			
824	Failed to detect the threading FG during unthreading.			

• Main code 2X : Abnormality related to the mechanism control

① Main code 20

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
018	Detected the abnormal current in the cassette up/down motor.	AUTO OFF	EJECT (Emergency EJECT)	Displayed until the next cassette is inserted.
111	Failed to complete the cassette down motion within the specified time.			
911	Failed to complete the cassette up motion within the specified time.			

4-10

② Main code 21

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
0C8	Detected the abnormal current in the reel position motor.	AUTO OFF	EJECT (Emergency EJECT)	Displayed until the next cassette is inserted.
0E8	Detected the abnormal current of M stop plunger solenoid.			
1C1	Failed to complete the reel position movement within the specified time.	Cassette tape will be ejected.		

③ Main code 22

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
0D8	Detected an abnormal current of cleaning plunger solenoid.	AUTO OFF	EJECT (Emergency EJECT)	Displayed until the next cassette is inserted.

• Main code 3X : Sensor trouble

Sub codes are all 000.

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
31	Failed to release the tape top.	STOP	PLAY, FF, EJECT	Displayed until the error is solved and any key is pressed.
32	Failed to release the tape end.	STOP	PLAY, REW, EJECT	
33	Detected an abnormal current of reel shift sensor LED.	Insertion of cassette tape is inhibited.	–	
34	Detected an abnormality of threading sensor.	Cassette tape insertion and unthreading are prohibited until the error is solved.		
35	Detected an abnormality of cassette compartment position sensor.	EJECT	–	
36	Detected an abnormality of fan motor.	Only error is displayed.	–	
39	Detected an abnormality of cassette top/end sensor LED.	STOP	PLAY, EJECT	
3A	Detected an abnormality of tension sensor.	AUTO OFF	EJECT (Emergency EJECT)	

Main code 91 : Abnormality of communication system or interface system

Main code	Sub code	Detected contents
91	125	Communication error between system control and keyboard (detected by SY).
	130	System control detected abnormality of ROM.
	131	System control detected abnormality of external memory.
	132	System control detected abnormality of internal memory.
	133	System control detected abnormality of common memory for SERVO.
	134	System control detected abnormality of common memory for SPCON.
	139	System control detected abnormality of EEPROM (IC8 on the DR-428 board).
	13A	Detected abnormality in NVRAM.
	13B	Detected abnormality in Resetable Hour Meter.
	13C	Detected abnormality in Volume adjustment data area.
	13F	Communication error to MIC.
	145	Communication error between system control and servo.
	175	Communication error between system control and SPCON.
	195	Communication error between system control and the SW microprocessor.
	1A5	Communication error between system control and external keyboard.
	1D5	Communication error between system control and the DV microprocessor.
	1E5	Communication error between system control and the DIF microprocessor.
	215	Communication error between system control and keyboard (detected by KY).
	430	Servo main detect abnormality of ROM.
	431	Servo detected abnormality of external memory.
	439	Detected abnormality in the servo adjustment data area.
	43B	Detected abnormality in Unresetable Hours Meter.
	455	Communication error between servo main and servo sub microprocessors.
	539	Detected abnormality in the EQ data area.
	730	SPCON detected abnormality of ROM.
	731	SPCON detected abnormality of external RAM (IC503 on the SSS-10 board).
	732	SPCON detected abnormality of internal RAM.
	733	SPCON detected abnormality of the communication IC (IC503 on the SSS-10 board) with SY.
	734	SPCON detected communication error (IC401 on the SSS-10 board) with SV.

Main code 92 to 94 : Abnormality of sync system

Main code	Sub code	Detected contents
92	101	System control detected abnormality in NSG OE.
	702	SPCON detected abnormality in P-TRKT.
	703	SPCON detected abnormality in P-FLTT.
	704	SPCON detected abnormality in R-TRKT.
	705	SPCON detected abnormality in R-FLTT.
93	407	The servo main microprocessor detected abnormality of P-FLTD.
	506	The servo sub microprocessor detected abnormality of P-TRKD.
94	409	The servo main microprocessor detected abnormality of R-FLTD.
	508	The servo sub microprocessor detected abnormality of R-TRKD.

Main code 95 : Communication error with digital process system IC

Main code	Sub code	Detected contents
95	120	Communication error between system control and C1R MOD.
	122	Communication error between system control and C1P MOD.
	12A	Communication error between system control and NSG.
	12C	Communication error between system control and VPRAD.
	415	Communication error between servo and D1R.
	416	Communication error between servo and HIF.
	423	Communication error between servo and D1P.
	511	Communication error between drum and M1.
	710	Frame communication error between SPCON and D1P.
	711	Track pair communication error between SPCON and D1P.
	712	Communication error between SPCON and V2P.
	713	Communication error between SPCON and F1P.
	714	Communication error between SPCON and SIFE.
	715	Communication error between SPCON and SIFP.
	720	Communication error between SPCON and AIFP.
	730	Frame communication error between SPCON and D1R.
	731	Track pair communication error between SPCON and D1R.
	732	Communication error between SPCON and V2R.
	733	Communication error between SPCON and F1R.
	734	Communication error between SPCON and SIFR.
	740	Frame communication error between SPCON and A1R Front.
	741	Track pair communication error between SPCON and A1R Front.
	742	Frame communication error between SPCON and A1R Rear.
	743	Track pair communication error between SPCON and A1R Rear.
	744	Communication error between SPCON and AIF-INDI.
	745	Communication error between SPCON and ACTL.
	751	Communication error between SPCON and REC-DSP.
	752	Communication error between SPCON and PB-DSP.
	753	Communication error between SPCON and OUT-DSP.

Possible causes of errors

Main code	02												06
Sub code / Possible causes	403 503 603	574 674 803	554 654	402 454 474	355 375	058 078	154 174 194 255 275 875 A55 A75 A95	254 854	594 694	494	395	496 596 696	3A7 4A7 5A7 6A7
1. Tape is stuck to the tape running mechanism.	O	O	O	O				O		O			O
2. Tape is loosely wound in the cassette.	O	O	O	O	O						O	O	
3. Cassette tape is not confined properly. (Cassette compartment is unlocked.)	O	O	O	O				O	O	O	O	O	
4. Reel motor does not generate the correct torque.	O	O	O	O	O	O	O	O	O	O	O	O	O
5. Abnormality of reel FG	O	O	O	O	O		O	O	O	O	O	O	O
6. Tension regulator is defective.	O												
7. Cut-and-spliced tape is used.		O	O		O			O			O	O	
8. Top detector and end detector are defective.			O	O				O	O				O
9. Pinch roller has insufficient pressure against capstan.								O				O	

Check procedure for the possible causes, and the related circuit boards and devices

Possible causes	Check items and check procedure	Related circuit boards and devices
1. Tape is stuck to the tape running mechanism. • Tape is dirty. • Tape run mechanism is dirty. • Humidity or condensation	• Check if tape is stuck to tape guides or drum. • Check if foreign material is adhered to tape. • Check if tape is damaged. • Check if foreign material is adhered to tape run mechanism and drum.	
2. Tape is loosely wound in the cassette. • A tape which has been used for many times, is used. • A damaged tape is used.	• Check if tape has severe non-uniform winding.	
3. Cassette tape is not confined properly. (Cassette compartment is unlocked.)	Check that the four pins of the cassette compartment are inserted into the holes of the slant table. Check that the cassette compartment retainer is securely fastened. ↓ If a cassette compartment is unlocked when a cassette compartment is inserted, exchange the cassette compartment. ↓ When a cassette compartment is lock after it is exchanged, the trouble is caused by the cassette compartment. Otherwise the trouble is caused by the defective drive circuit.	cassette compartment DR-428 board

Possible causes	Check items and check procedure	Related circuit boards and devices
4. Reel motor does not generate the correct torque. • Reel brake has mechanical defect. • Reel brake solenoid is open. • Reel brake solenoid drive IC is defective. • Reel motor is defective. • Reel motor drive circuit is defective. • Harness is defective.	• When the S and T reel brakes are considered to be the cause of trouble : Check the S and T reel brakes. Check that the S and T reel brakes are released. • When the S and T reel motors are considered to be the cause of trouble : Perform the servo adjustment. Confirm that the servo adjustment is completed as intended.	When the reel brake is considered to be the cause of trouble : DR-428 board, reel brake solenoid When the S and T reel motor or the S and T reel FG is considered to be the cause of trouble : DR-428 board, S and T reel motor
5. Abnormality of reel FG • S and T reel motor is defective. • S and T reel FG amp is defective.	Perform the S and T reel adjustment. Confirm that the reel FG adjustment is completed as intended.	
6. Tension regulator is defective.	Check the magnet position using the tension adjustment menu. Confirm that OK appears on display.	SSS-10 board, DR-428 board, SE-538 board
7. Cut-and-spliced tape is used.		
8. Top detector and end detector are defective.	Check the tape top and tape end. The top and end sensor must turn on and off correctly.	When the tape top sensor is considered to be the cause of trouble : SE-522 board, DR-428 board, tape top sensor LED When the tape end sensor is considered to be the cause of trouble : SE-521 board, DR-428 board, tape end sensor LED
9. Pinch roller has insufficient pressure against capstan. • Pinch roller has mechanical defect. • Pinch solenoid is open. • Pinch solenoid drive IC is defective.	Check the pinch roller. Pinch roller must be pressed against the capstan shaft correctly.	DR-428 board, pinch solenoid

4-3. Countermeasure in an Emergency

4-3-1. How to Take Out the Cassette Whose Tape is Slacked (MANUAL EJECT)

(1) Turn the power off.
(2) Remove the top panel. (Refer to Section 3-3.)
(3) Remove the front panel. (Refer to Section 3-3.)
(4) Turn the manual eject gear A (red) in the arrow direction with a phillips screwdriver while pressing the gear. When the tape comes to slack, turn the reel table from the front side utilizing a skewer and wind the tape.

Note

In a case of standard cassette and M cassette :
   Turn the reel table (T)
In a case of mini cassette :
   Turn the reel table (S)

(5) Repeat step (4) until each guide comes to the unthreading end position and furthermore the tape completely returns into the cassette.
(6) Turn the manual eject gear B (red) in the arrow direction until the cassette compartment completely comes into cassette out state.

Manual eject gear A (red)

Reel table (S)

Manual eject gear B (red)

Skewer   Reel table (T)
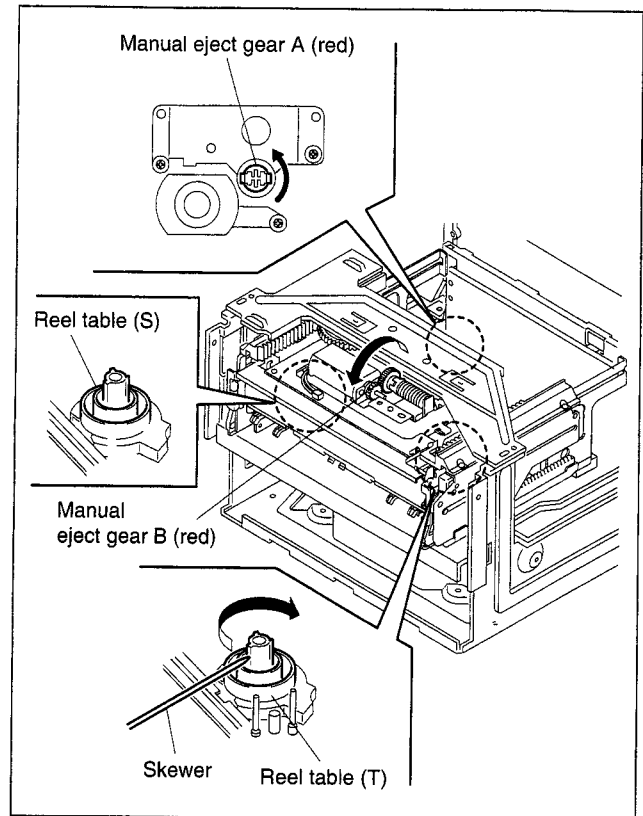
4-3-2. Head Cleaning when Head Clogging Occurs

Clean the video head as follows when the video head gets dirty.

Procedure to Use the Cleaning Cassette

| Note |

Use only the cleaning cassette tape as follows.
If another cleaning cassette tape is used, abnormal abrasion or breakage of the video head could occur.

Cleaning cassette tapes :

DV12CL (Standard)
DVM12CL (Mini)

1. Insert the specific cleaning cassette tape in this unit.
   The unit is automatically set in the PLAY mode and the cleaning tape starts running.
   Confirm that the | PLAY | key lights and the display appears.
2. The cleaning cassette tape is automatically ejected after running for 10 seconds.

   | Note |

   Do not rewind the cleaning cassette tape to use it again.

3. Make sure that the head is no longer dirty.
   If the video head is still dirty after step 2 above, clean the video head as follows.

Procedure to Use the Cleaning Cloth

1. Soak the cleaning cloth with cleaning liquid and bring it into contact lightly with the video head.
2. Turn the upper drum slowly by hand in the rotating direction of the head (counterclockwise when viewed from the top) to clean the video head.

   | Notes |

   • Never move the cleaning cloth in the vertical direction against the video head because it may break the head.
   • Turn the power switch off when cleaning the video head.

4-3-3. Operating the VTR without A Cassette Tape

The VTR can be operated without a cassette tape by the following switch setting.

Switch Setting

1. Remove the cassette compartment from this unit.
2. Turn on switches S400-4 of the SSS-10 board.
3. Then turn on the main power.

Operating Method

Threading
While pressing the S/T reel motors, press the | STOP | key.
The upper drum rotates, threading ring rotates. The unit enters the threading mode.
The tension arm and the threading ring move to the specified position, then the threading is completed.
This condition in which the threading is completed is referred to as the STOP status.

PLAY
Press the | PLAY | key.
The pinch roller is pressed against the capstan shaft to enter the PLAY status.
When the | PLAY | key is pressed during threading, the pinch roller is pressed against the capstan shaft to enter the PLAY status after the threading has completed.

FF
Press the | F FWD | key.
The pinch roller is pressed against the capstan shaft to set the FWD.SEARCH to five-times speed.

REW
Press the | REW | key.
The pinch roller is pressed against the capstan shaft to set REV.SEARCH to five-times speed.

REC

While pressing the record proof sensor on the right side of the T side reel table, press both the PLAY key and the REC key.

The pinch roller is pressed against the capstan shaft to enter REC status.

When the record proof sensor is released, the REC status is released and the recorder returns to PLAY status.

Unthreading

Press the EJECT key.

Each guide moves to the specified position to complete the unthreading.

Reel position selection

Press the SET (YES) key on the control panel.

Reel position will be changed as shown below in accordance with the number of pressing the SET (YES) key.

Mini ⟶ M ⟶ STD
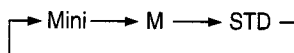
Note

Make sure to turn off switches S400-4 on the SSS-10 board after the adjustment.

Section 5
Maintenance Menu

5-1. Menu Structure

This unit has a maintenance menu which is used for maintenance.

The maintenance menu has a layered structure through which you move to perform the various checks, settings and adjustments using the specified menu items. Contents of the maintenance menu are displayed on the video monitor connected to the VIDEO OUT B-Y/CPST (SUPER) connector and the time counter of DSR-1500/1500P.

Values in parenthesis ( ) are time counter display.

MENU, First layer	MENU, Second layer	MENU, Third layer
MENU DATA CONTROL (MENU CNT)	MENU STATUS DISPLAY (>MENU STA) SAVE MENU DATA (>Save MENU) LOAD MENU DATA (>Load MENU)	
EDIT CHECK (EDIT Check)	VIDEO INSERT (>VIDEO INS) A1 INSERT (>A1 INS) A2 INSERT (>A2 INS) TC INSERT (>TC INS) ASSEMBLE (>ASSEMBLE)	
SERVO CHECK (SV Check)	SENSOR CHECK (>Sensor)	CASS-COMPARTMENT (>>Cass-COM) TAPE TOP/END (>>Top/End) HUMID [MOISTURE] (>>HUMID) REC INHIBIT (>>REC INHI.)
	MOTOR CHECK (>Motor)	S-REEL (>>S-Reel) T-REEL (>>T-Reel) THREADING (>>Threading) CASS-COMPARTMENT (>>Cass-COM) CAPSTAN (>> Capstan) DRUM (>>Drum) REEL POSITION (>>Reel POS.)
	PLUNGER CHECK (>Plunger)	PINCH (>>Pinch) REEL BRAKE (>>Brake) M PLUNGER (>>M Plunger) HEAD CLEANER (>>H. Cleaner)
SERVO ADJUST (SV Adjust)	S/T-REEL & CAPSTAN (>Reel & Cap.) S-REEL ONLY (>S-Reel) T-REEL ONLY (>T-Reel) CAPSTAN ONLY (>Capstan) TENSION (>Tension)	
TAPE PATH ADJUST (TP Adjust)	TRACKING ADJUST (>Tracking)	
	RF SWITCHING POSITION (>Switching)	

Values in parenthesis ( ) are time counter display.

MENU, First layer	MENU, Second layer	MENU, Third layer
ELECTRICAL ADJUST (EL Adjust)	PLL F0 (>PLL f0)	
	EQ AUTO ADJ (>EQ auto)	DVCAM (>>DVCAM) DV (>>DV) DVCPRO (>>DVC PRO)
	EQ MANUAL ADJ (>EQ manual)	DVCAM (>>DVCAM) DV (>>DV) DVCPRO (>>DVCPRO)
	REC CURRENT (>REC cur) FE CHECK (>FE check)	
	PROCESS CHECK : OFF (>Proc check)	OFF (>>off) DPR (>>dpr) MAIN (>>main) SUB (>>sub) PRE (>>pre)
	REF CHECK : OFF (>REF check)	OFF (>>off) NON-STD (>>Non-STD) STD (>>STD)
	RP DATA INITIALIZE (>RP initial)	
SERVICE SUPPORT (Support)	ERROR LOG (>Error LOG) MANUAL EJECT (>Manu. Eject)	
	DIAGNOSTICS CONTROL (>DIAG CNT)	CLEAR ERROR LOG (>>Clear LOG)
OTHERS (Others)	SOFTWARE VERSION (>Version) DSBK-1503 SERIAL NO. (>DVIO No.) KEYBOARD CHECK (>KY Check)	
	MEMORY DISPLAY (>MEM Check)	SY MEMORY DISPLAY (>> SY MEM.) SV MEMORY DISPLAY (>> SV MEM.) SP MEMORY DISPLAY (>> SP MEM.) KY MEMORY DISPLAY (>> KY MEM.) CM DISPLAY (>> CM DISP.)
	DATA DISPLAY (>Data Check)	SP DATA DISPLAY (>>SP DATA)

5-2. How to Operate Maintenance Menu

5-2-1. Location and Function of Switches

Use ▲, ▼, ◀, ▶, MENU, SET (YES), TC RESET, RESET (NO) switches on the front panel shown below to perform the maintenance menu.
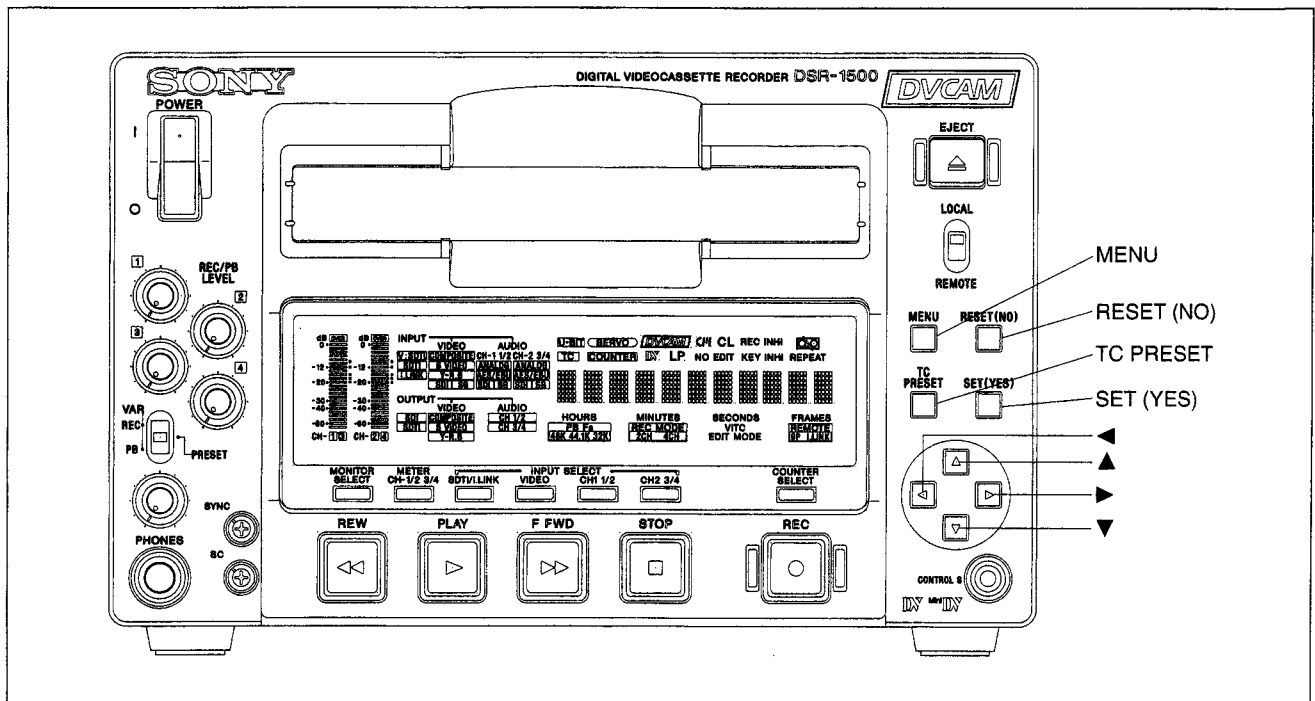
The maintenance menu has a layered structure through which you move to select the desired item.
▲ KEY : Use this key to move in the direction of ↑ within the same layer.
▼ KEY : Use this key to move in the direction of ↓ within the same layer.
◀ KEY : Use this key to move in the direction of ← to higher layers.
▶ KEY : Use this key to move in the direction of → to lower layers. (It is inoperative if there is no lower layer.)

To indicate depth of layer, the displayed menu items are indented on the video monitor and ">" is added to the top on the time counter.

5-2-2. How to Enter the Maintenance Menu

1. While pressing the ◀ key, press the MENU key. The DSR-1500/1500P enters the maintenance menu. The maintenance menu appears on the video monitor.
2. Select the desired item using the ▲ key and the ▼ key. The cursor shown with a white background moves to the selected item.
3. After the desired item is selected, press the ▶ key to designate the selected item.

5-2-3. How to Exit the Maintenance Menu

Press the MENU key to exit the maintenance menu.

5-3. Contents of Maintenance Menu

5-3-1. Menu Data Control

The MENU DATA CONTROL item provides a SETUP MENU data display and saving and loading the SET UP MENU data.
This item is used to return the settings to their original values after maintenance is complete or ROM upgrading is complete.

Operating procedure

1. Enter the maintenance menu.
2. Move the cursor to "MENU DATA CONTROL" which is displayed with a white background, using the ▲ , ▼ keys.

```
          MAINTENANCE MENU
 MENU DATA CONTROL          →
 EDIT CHECK
 SERVO CHECK
 SERVO ADJUST
 TAPE PATH ADJUST
 ELECTRICAL ADJUST
 SERVICE SUPPORT
 OTHERS
```

```
 MENU CNT
```

3. Press the ▶ key.
   "MENU DATA CONTROL" is selected and its lower layer submenu appears.

```
          MAINTENANCE MENU
      MENU DATA CONTROL
 ← MENU STATUS DISPLAY   →
     SAVE MENU DATA
     LOAD MENU DATA
```

```
 >MENU STA
```

4. Move the cursor displayed with a white background to a desired item using the ▲ , ▼ keys.
5. When an item is selected, press the ▶ key. The contents of the selected item appear.
6. Press the ◀ key to exit MENU DATA CONTROL and return to the main menu.
7. Press the MENU key to exit the maintenance menu.

(1) MENU STATUS DISPLAY

Displays the current status of the SET UP MENU data.

MENU VERSION :   Version number of the SET UP MENU
NUMBER OF ITEM :   Numbers of the SET UP MENU items
CHANGED ITEM :   Numbers of the items which were changed from the factory default settings
DATA CHECK SUM : Data check sum
Pressing ▶ key displays the status of the SET UP MENU stored in the menu bank 1 to 4.

```
          MENU STATUS

   MENU VERSION    : V1.0

   NUMBER OF ITEM :   103
   CHANGED ITEM    :   000
   DATA CHECK SUM :  1646


      BANK SEL :  (←)(→) KEY
      TO MENU  :  MENU KEY
```

```
>>Menu V1.0
```

(2) SAVE MENU DATA

This is used to temporarily save the user's SETUP MENU data. A temporary saved data can be reset later.

1. The version of the current setup menu is displayed, and it is waiting to press the SET (YES) key.
   * Pressing the MENU key returns to the main menu.

```
       SAVE MENU DATA

    CURRENT MENU VERSION
            V1.0

         SAVE OK ?


       SAVE :    SET KEY
     TO MENU :  MENU KEY
```

```
>>Save OK ?
```

2. Press the SET (YES) key.
   The SET UP MENU data is stored in EEPROM.
   Confirm that [COMPLETE] appears and data saving is complete.

```
       SAVE MENU DATA

       COMPLETE !!


    TO MENU :  MENU KEY
```

```
Complete !!
```

| Notes |

• Data which has once been saved will not be deleted by turning the main power on and off, or by upgrading the ROM version. However, the saved data is deleted when the DR-428 board or the EEPROM is replaced because the data is saved in the EEPROM in the DR-428 board.
• When the SET UP MENU is upgraded by ROM's version upgrade, an alarm message appears after the ROM is replaced. Either initialize the SET UP MENU or execute "LOAD MENU DATA" when the alarm appears.

(3) LOAD MENU DATA

The saved data is stored as ordinary SET UP MENU data when it is loaded.

1. The version number of the current SET UP MENU and that of the SET UP MENU to be loaded are displayed, and it is waiting to press the [SET (YES)] key.
   * Pressing the [MENU] key returns to the main menu.

```
        LOAD MENU DATA

   SAVED           CURRENT
   MENU            MENU
   VERSION         VERSION
   V0.3    --->     V1.0

          LOAD OK ?


          LOAD :   SET KEY
       TO MENU : MENU KEY
```

```
>>Load OK ?
```

2. Press the [SET (YES)] key.
   The SET UP MENU data is stored in EEPROM.
   Confirm that [COMPLETE] appears and data saving is complete.

```
        LOAD MENU DATA

        COMPLETE !!

   UNCHANGED DATA : 088
   CHANGED DATA   :  0
   ILLEGAL DATA   :  0
   DELETED ITEM   :  0
   ADDED ITEM     :  0


        TO MENU : MENU KEY
```

```
Complete!!
```

In the case of trouble :
Loading of the data will not start if SET UP MENU data has not been saved or the saved SET UP MENU data contains an error.

5-3-2. EDIT CHECK

Enables the editing function to be checked without using a remote controller.

Operating procedure

1. Enter the maintenance menu.
2. Move the cursor to "EDIT CHECK" which is displayed with a white background using the [▲], [▼] keys.

```
      MAINTENANCE MENU
MENU DATA CONTROL
EDIT CHECK
SERVO CHECK
SERVO ADJUST
ELECTRICAL ADJUST
SERVICE SUPPORT
OTHERS
```
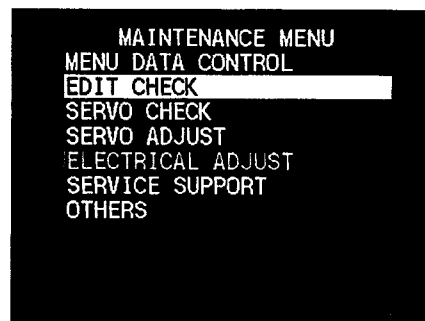
```
EDIT Check
```

3. Press the [▶] key.
   "EDIT CHECK" is selected and its lower layer submenu appears.

```
      MAINTENANCE MENU
EDIT CHECK
← VIDEO INSERT        →
  A1 INSERT
  A2 INSERT
  TC INSERT
  ASSEMBLE
```
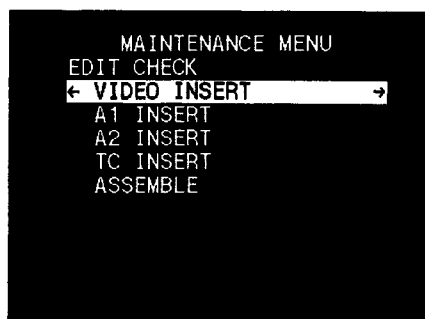
```
>VIDEO INS
```

4. Move the cursor displayed with a white background to a desired item using the [▲], [▼] keys.
5. When an item is selected, press the [▶] key. The contents of the selected item appear.
6. Press the [◀] key to exit EDIT CHECK and return to the main menu.
7. Press the [MENU] key to exit the maintenance menu.

1. VIDEO INSERT

Pressing the [REC] and [PLAY] keys simultaneously enters the VIDEO INSERT mode.

```
      EDIT CHECK MODE

   PUSH REC & PLAY KEY.
   VIDEO INSERT WILL BE
        PERFORMED.

      T*R 00:00.00.00


     TO MENU : MENU KEY
```

2. A1 INSERT

Pressing the [REC] and [PLAY] keys simultaneously enters the AUDIO CH-1 INSERT mode.

```
      EDIT CHECK MODE

   PUSH REC & PLAY KEY.
    A1 INSERT WILL BE
        PERFORMED.

      T*R 00:00.00.00


     TO MENU : MENU KEY
```

3. A2 INSERT

Pressing the [REC] and [PLAY] keys simultaneously enters the AUDIO CH-2 INSERT mode.

```
      EDIT CHECK MODE

   PUSH REC & PLAY KEY.
    A2 INSERT WILL BE
        PERFORMED.

      T*R 00:00.00.00


     TO MENU : MENU KEY
```

4. TC INSERT

Pressing the [REC] and [PLAY] keys simultaneously enters the TIME CODE INSERT mode.

```
      EDIT CHECK MODE

   PUSH REC & PLAY KEY.
    TC INSERT WILL BE
        PERFORMED.

      T*R 00:00.00.00


     TO MENU : MENU KEY
```

5. ASSEMBLE

Pressing the [REC] and [PLAY] keys simultaneously enters the ASSEMBLE mode.

| Note |

When the AUDIO REC MODE is set to 4 channel, A1 is assigned to CH-1 and CH-2, and A2 is assigned to CH-3 and CH-4.

```
      EDIT CHECK MODE

   PUSH REC & PLAY KEY.
    ASSEMBLE WILL BE
        PERFORMED.

      T*R 00:00.00.00


     TO MENU : MENU KEY
```

5-3-3. Servo Check

Checks the servo system automatically or semi-automatically.

Operating procedure

1. Enter the maintenance menu.
2. Move the cursor to "SERVO CHECK" which is displayed with a white background using the ▲, ▼ keys.

```
     MAINTENANCE MENU
MENU DATA CONTROL
EDIT CHECK
SERVO CHECK              →
SERVO ADJUST
TAPE PATH ADJUST
ELECTRICAL ADJUST
SERVICE SUPPORT
OTHERS
```

```
SV Check
```

3. Press the ► key.
   "SERVO CHECK" is selected and its lower layer submenu appears.
4. Move the cursor displayed with a white background to a desired item using the ▲, ▼ keys.

```
     MAINTENANCE MENU
SERVO CHECK
   SENSOR CHECK
   MOTOR CHECK
   PLUNGER CHECK
```

```
>Sensor
```

5. Press the ► key.
   The lower layer submenu appears.
6. Move the cursor displayed with a white background to a desired item using the ▲, ▼ keys.
7. Press the ► key to select the desired item.
8. Press the SET (YES) key to execute the selected item.
9. After completing the check, press the MENU key to return to the main menu.
10. To check other menus and submenus, repeat steps 4 to 9.
11. Press the MENU key to exit the maintenance menu.

```
     MAINTENANCE MENU
SERVO CHECK
   SENSOR CHECK
 ←   CASS-COMPARTMENT    →
   TAPE TOP/END
   HUMID(MOISTURE)
   REC INHIBIT
```

```
>>Cass-COM
```

Note

If the MENU key is pressed while the check is in progress, the check operation is forcibly ended and the display returns to the main menu.
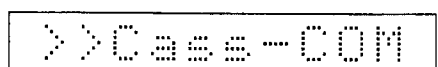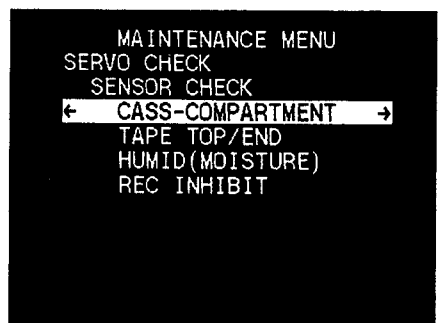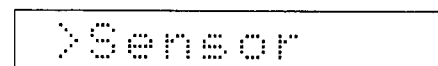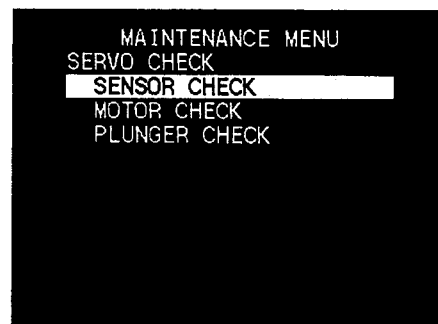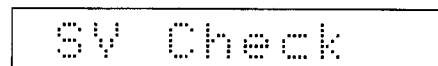
1. SENSOR CHECK

The respective items of "SENSOR CHECK" are described below :

① CASS-COMPARTMENT

Checks the respective switches of the cassette compartment.

SW/Sensor	Applicable board
PH1 PH2 PH3 PH4	CC-85
S1 S2 S3	CC-84


```
      MAINTENANCE MENU
  SERVO CHECK
     SENSOR CHECK
  ←    CASS-COMPARTMENT    →
     TAPE TOP/END
     HUMID(MOISTURE)
     REC INHIBIT
```

```
>>Cass-COM
```
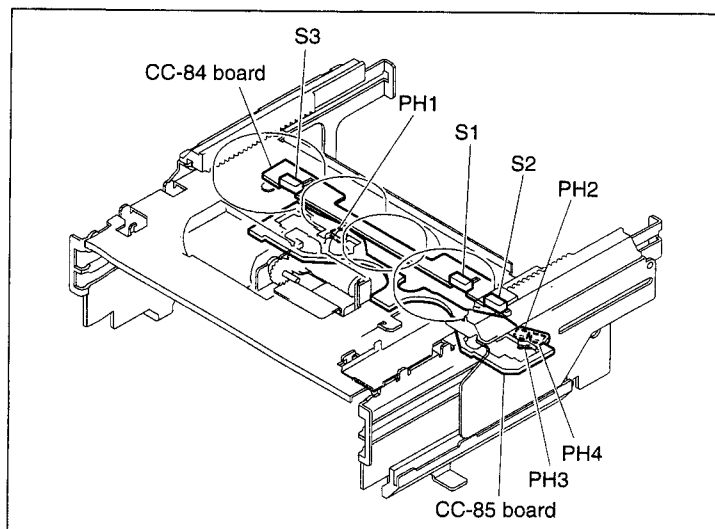

1. Execute the CASS-COMPARTMENT.
2. Confirm that the sensors are all OFF with no cassette inserted.

```
      SERVO CHECK MODE

     CASS-COMPARTMENT SW
  CASS IN SW      (PH1): OFF
  MINI IN SW      (PH2): OFF
  M    IN SW      (PH3): OFF
  STD  IN SW      (PH4): OFF
  M ADPT SIZE SW (S1): OFF
  M      SIZE SW (S2): OFF
  STD    SIZE SW (S3): OFF

       CANCEL : MENU KEY
```

```
CHECKING
```
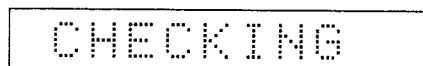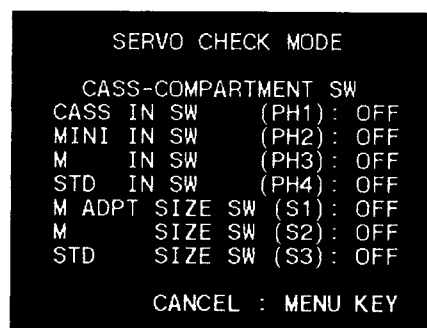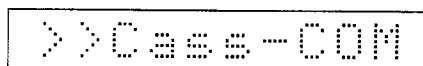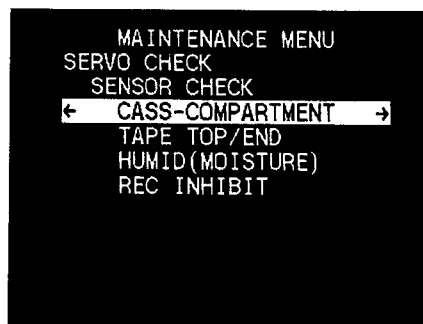
3. Insert the mini-cassette and confirm that the status of the sensor is the monitor display shown right.

```
      SERVO CHECK MODE

   CASS-COMPARTMENT SW
 CASS IN SW      (PH1):  ON
 MINI IN SW      (PH2):  ON
 M    IN SW      (PH3):  --
 STD  IN SW      (PH4):  --
 M ADPT SIZE SW  (S1):  OFF
 M       SIZE SW (S2):  OFF
 STD     SIZE SW (S3):  OFF

        CANCEL :  MENU KEY
```

4. Insert the M-cassette and confirm that the status of the sensor is the monitor display shown right.

```
      SERVO CHECK MODE

   CASS-COMPARTMENT SW
 CASS IN SW      (PH1):  ON
 MINI IN SW      (PH2):  --
 M    IN SW      (PH3):  ON
 STD  IN SW      (PH4):  --
 M ADPT SIZE SW  (S1):  ON
 M       SIZE SW (S2):  ON
 STD     SIZE SW (S3):  OFF

        CANCEL :  MENU KEY
```

5. Insert the standard cassette and confirm that the status of the sensor is the monitor display shown right.

```
      SERVO CHECK MODE

   CASS-COMPARTMENT SW
 CASS IN SW      (PH1):  ON
 MINI IN SW      (PH2):  --
 M    IN SW      (PH3):  --
 STD  IN SW      (PH4):  ON
 M ADPT SIZE SW  (S1):  ON
 M       SIZE SW (S2):  ON
 STD     SIZE SW (S3):  ON

        CANCEL :  MENU KEY
```

6. Insert the M-ADPT (Cassette adaptor for DVCPRO) and confirm that the status of the sensor is the monitor display shown right.

```
      SERVO CHECK MODE

   CASS-COMPARTMENT SW
 CASS IN SW      (PH1):  --
 MINI IN SW      (PH2):  --
 M    IN SW      (PH3):  --
 STD  IN SW      (PH4):  --
 M ADPT SIZE SW  (S1):  OFF
 M       SIZE SW (S2):  ON
 STD     SIZE SW (S3):  OFF

        CANCEL :  MENU KEY
```

* — — : not care

② TAPE TOP/END

Checks the tape-top and tape-end sensors.


```
        SERVO  CHECK  MODE

         TOP/END  SENSOR


    TOP  SENSOR  :  ON!
            LEVEL    (**)
    END  SENSOR  :  ON!
            LEVEL    (**)


       CANCEL  :  MENU  KEY
```

```
    CHECKING
```
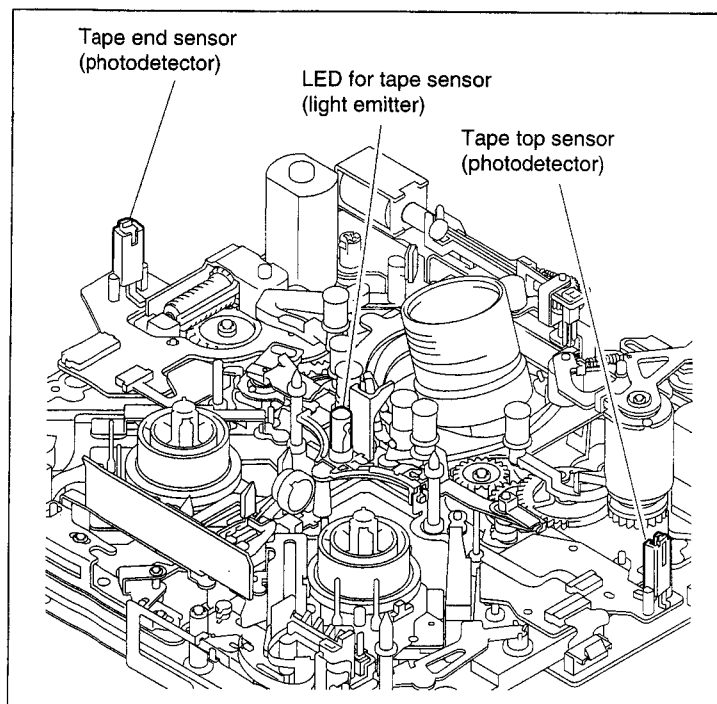
1. Execute the TAPE TOP/END.
2. Confirm that both TOP SENSOR and END SENSOR are [ON!].
3. Interrupt between the LED for the tape sensor (light emitter) and the tape-top sensor (photodetector) by inserting a finger or the like.
    Confirm that the TOP SENSOR display changes from [ON!] to [OFF] on the monitor display.

```
        SERVO  CHECK  MODE

         TOP/END  SENSOR


    TOP  SENSOR  :  ON!
            LEVEL    (**)
    END  SENSOR  :  OFF
            LEVEL    (**)


       CANCEL  :  MENU  KEY
```

4. Interrupt between the LED for the tape sensor (light emitter) and the tape-end sensor (photodetector) by inserting a finger or the like.
    Confirm that the END SENSOR display changes from [ON!] to [OFF] on the monitor display.

```
        SERVO  CHECK  MODE

         TOP/END  SENSOR


    TOP  SENSOR  :  OFF
            LEVEL    (**)
    END  SENSOR  :  ON!
            LEVEL    (**)


       CANCEL  :  MENU  KEY
```

In the case of trouble :
If the display does not change check whether the tape-top sensor or the tape-end sensor itself is defective.
Check also the tape-top/tape-end sensor circuit (DR-428, SE-521/522 board).

③ HUMID (MOISTURE)

Checks the HUMID (condensation) sensor.

HUMID (condensation) sensor

```
SERVO CHECK MODE

HUMID(MOISTURE) SENSOR



        DRY


CANCEL : MENU KEY
```

```
CHECKING
```
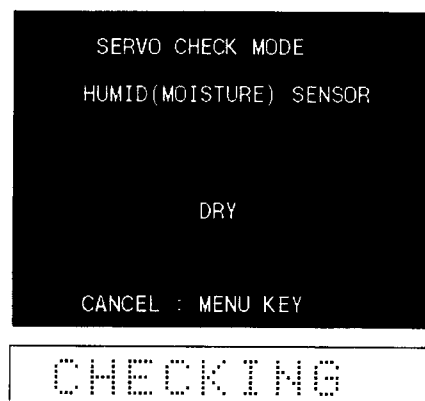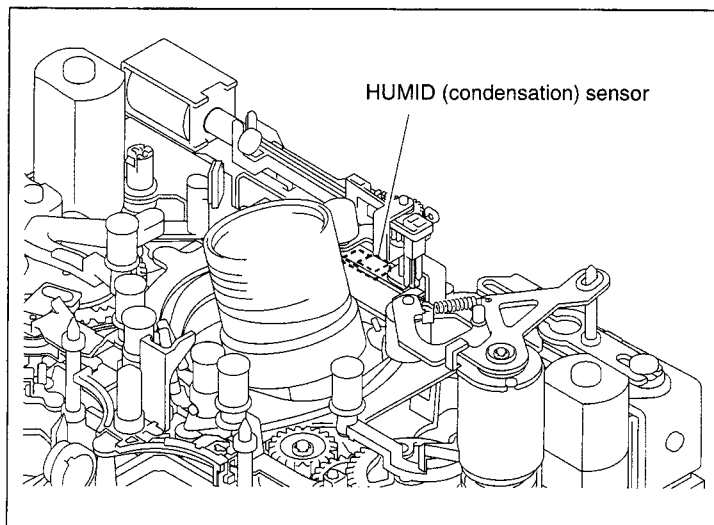
1. Execute the HUMID (MOISTURE).
2. Bring a cotton swab moistened with water in contact with the HUMID sensor.
   Confirm that [DRY] changes to [WET!] on the monitor display.

```
SERVO CHECK MODE

HUMID(MOISTURE) SENSOR



        WET!


CANCEL : MENU KEY
```

3. Blow wind onto the HUMID sensor to evaporate any water.
   Confirm that the display changes to [DRY] on the monitor 30 minutes later.
   | Note |
   Once the HUMID sensor detects [WET!], even if make it dry immediately, it takes 30 minutes to detect [DRY].

In the case of trouble :
If the display does not change from DRY to WET!, check whether the HUMID sensor itself is defective.
Check also the HUMID sensor detection circuit (DR-428 board).

④ REC INHIBIT

Checks the REC INHIBIT switch.
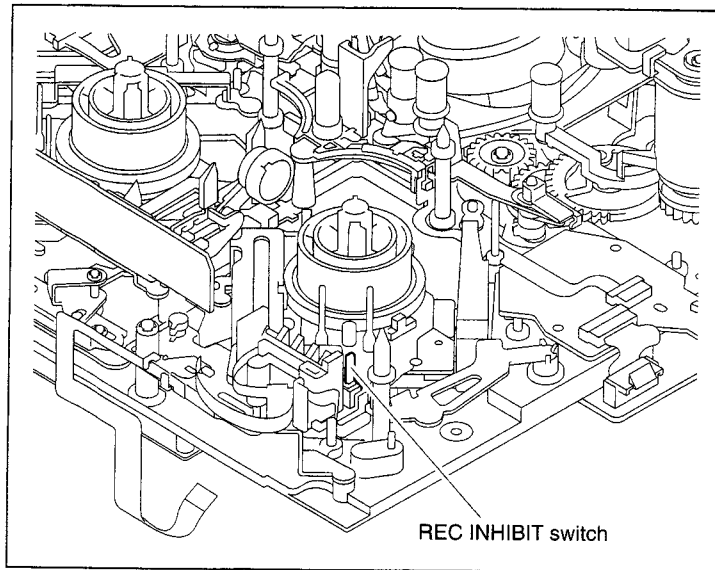
REC INHIBIT switch

1. Execute the REC INHIBIT.
2. Confirm the monitor display is as shown right.

```
       SERVO CHECK MODE

       REC INHIBIT SW


             OFF


       CANCEL : MENU KEY
```

```
   CHECKING
```
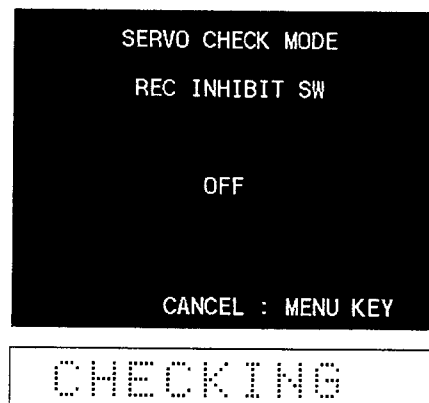
3. Press the REC INHIBIT switch.
   Confirm that ON is displayed on the monitor display.

```
       SERVO CHECK MODE

       REC INHIBIT SW


              ON


       CANCEL : MENU KEY
```
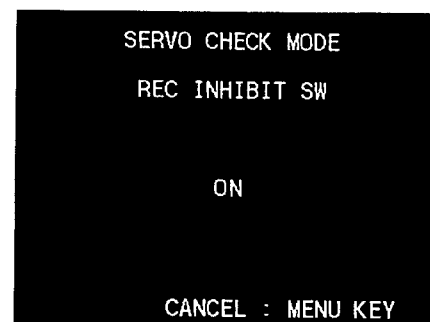
In the case of trouble :

If OFF is not displayed, check the sensor on the MIC arm.

2. MOTOR CHECK

The respective items of "MOTOR CHECK" are described below :

```
       MAINTENANCE MENU
  SERVO CHECK
    MOTOR CHECK
        S-REEL
        T-REEL
        THREADING
        CASS-COMPARTMENT
        CAPSTAN
        DRUM
        REEL POSITION
```

```
>> S-Reel
```

① S-REEL

Checks the S-reel motor.

1. Execute the S-REEL.
2. Press and hold the ▲ , ▼ keys for one to two seconds, and release the reel brake by activating the brake solenoid. Confirm that the S reel motor rotates clockwise and counterclockwise respectively during pressing the ▲ , ▼ keys.

```
       SERVO CHECK MODE

        S REEL MOTOR



  WIND OUT DIR.  :  (↑) KEY
  WIND IN  DIR.  :  (↓) KEY


        CANCEL  :  MENU KEY
```

```
CHECKING
```

In the case of trouble :
If the brake solenoid does not emit the operating sound and the S reel motor does not rotate in the specified direction even though pressing the ▲ , ▼ keys, check the S reel motor assembly and reel motor driver circuit (SSS-10 board and DR-428 board).

② T-REEL

Checks the T-reel motor.

1. Execute the T-REEL.
2. Press and hold the ▲ , ▼ keys for one to two seconds, and release the reel brake by activating the brake solenoid. Confirm that the T reel motor rotates clockwise and counterclockwise respectively during pressing the ▲ , ▼ keys.

```
       SERVO CHECK MODE

        T REEL MOTOR



  WIND IN  DIR.  :  (↑) KEY
  WIND OUT DIR.  :  (↓) KEY


        CANCEL  :  MENU KEY
```

```
CHECKING
```

In the case of trouble :
If the brake solenoid does not emit the operating sound and the T reel motor does not rotate in the specified direction even though pressing the ▲ , ▼ keys, check the T reel motor assembly and reel motor driver circuit (SSS-10 board and DR-428 board).

③ THREADING

Checks the threading motor, the thread-end sensor, unthread-end
sensor and the cassette compartment.

1. Execute the THREADING.

```
         SERVO CHECK MODE

        THREADING MOTOR


          THREAD  END



       THREADING  :   (↑) KEY
       UNTHREADING :  (↓) KEY
            CANCEL :  MENU KEY
```

```
 CHECKING
```

2. Press and hold the ▲ key.
    Confirm that the threading ring completes threading and the
    message "THREAD END" appears on the monitor display.

```
         SERVO CHECK MODE

        THREADING MOTOR

           THREAD  END
              ↑ ↓
          UNTHREAD  END


       THREADING  :   (↑) KEY
       UNTHREADING :  (↓) KEY
            CANCEL :  MENU KEY
```

```
 CHECKING
```

3. Press and hold the ▼ key.
    Confirm that the threading ring completes unthreading and
    "UNTHREAD END" appears on the monitor display.

```
         SERVO CHECK MODE

        THREADING MOTOR


          UNTHREAD  END



       THREADING  :   (↑) KEY
       UNTHREADING :  (↓) KEY
            CANCEL :  MENU KEY
```

```
 CHECKING
```

In the case of trouble :
If the threading motor does not rotate, or if the message
"THREAD END" does not appear even though threading is
complete, or if the message "UNTHREAD END" does not appear
on the monitor even though the unthreading is complete, check the
threading motor, the cassette compartment, the SSS-10 board.
Check also the DR-428 board (the driver circuit and the threading
FG amplifier circuit) and the SE-521 board (the sensor).

④ CASS-COMPARTMENT

Check the cassette compartment motor.

1. Execute the CASS-COMPARTMENT.

```
     SERVO  CHECK  MODE

  CASS-COMPARTMENT  MOTOR
          OFF

          UP



      NEXT  :   (→)  KEY
      CANCEL  :  MENU  KEY
```

```
CHECKING
```

2. Press the [▶] key.
   Confirm that the cassette compartment moves down.
3. Press the [▶] key again, and confirm that the cassette
   compartment moves up.
   (The monitor display changes in the reverse order of the
   steps for moving down the cassette compartment.)

```
     SERVO  CHECK  MODE

  CASS-COMPARTMENT  MOTOR
           ON

        HORIZON


      NEXT  :   (→)  KEY
      CANCEL  :  MENU  KEY
```

```
CHECKING
```

```
     SERVO  CHECK  MODE

  CASSETTE  COMP. MOTOR




        VERTICAL

  CHECK   :  (→)  KEY
  CANCEL  :  MENU  KEY
```

```
CHECKING
```

In the case of trouble :
If the monitor display does not change, check the cassette
compartment motor, the SSS-10 board (the sensor input circuit)
and the CC-83 board (the sensor).

```
     SERVO  CHECK  MODE

  CASS-COMPARTMENT  MOTOR
          OFF



          DOWN
      NEXT  :   (→)  KEY
      CANCEL  :  MENU  KEY
```

```
CHECKING
```

⑤ CAPSTAN

Checks the capstan motor.

1. Execute the CAPSTAN.

```
SERVO CHECK MODE

CAPSTAN MOTOR




CHECK   :  (→)  KEY
CANCEL  :  MENU KEY
```

```
CHECKING
```
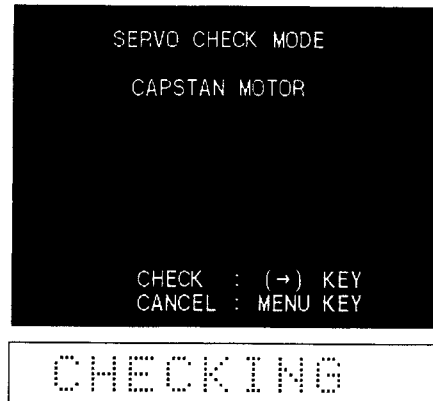
2. Press the [▶] key.
   Confirm that [FORWARD ... OK] appears on the monitor display.

```
SERVO CHECK MODE

CAPSTAN MOTOR


FORWARD....OK



CHECK   :  (→)  KEY
CANCEL  :  MENU KEY
```

```
CHECKING
```
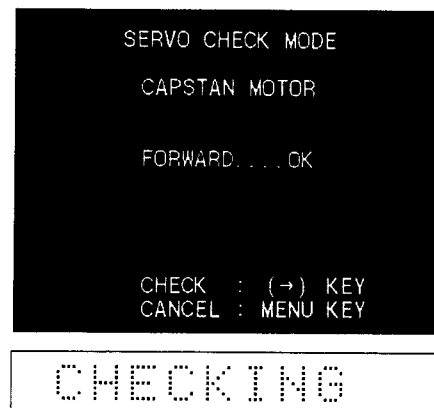
3. Press the [▶] key again.
   Confirm that [REVERSE ... OK] appears on the monitor display.

```
SERVO CHECK MODE

CAPSTAN MOTOR


REVERSE....OK



CHECK   :  (→)  KEY
CANCEL  :  MENU KEY
```

```
CHECKING
```
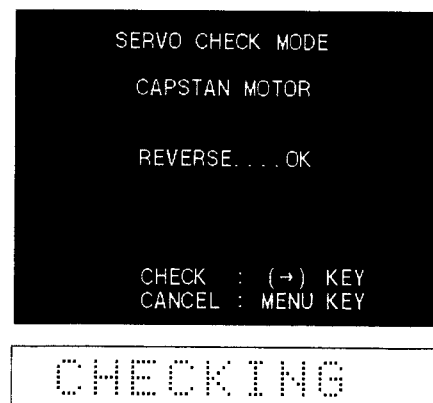
In the case of trouble :

If the monitor display does not change, check the capstan motor and the capstan motor driver circuits (the SSS-10 board, DR-428 board)

⑥ DRUM

Checks the drum motor.

1. Execute the DRUM.
2. Confirm the monitor display is as follows.
    SPEED : [OK]
    PHASE : [LOCK]
    PG : [EXIST]

```
     SERVO CHECK MODE

        DRUM MOTOR

   SPEED :      OK
   PHASE :      LOCK
   PG    :      EXIST


   CANCEL : MENU KEY
```

```
CHECKING
```

In the case of trouble :

If the monitor display does not change, check the drum motor, the DR-428 board (the drum motor driver circuit, the drum FG amp circuit and the drum PG amp circuit).

⑦ REEL POSITION

Checks the reel position motor and the reel MINI/M/STD position sensor.

1. Execute the REEL POSITION.

```
        SERVO CHECK MODE

     REEL POSITION MOTOR
             OFF

        MINI-POSITION




        CHECK  :   (→) KEY
        CANCEL :  MENU KEY
```

```
 CHECKING
```

2. Confirm that the reel table moves in the order of the MINI position → the M position → the STD position then returning to the MINI position each time pressing the ▶ key and the monitor display changes in accordance with the move.

```
        SERVO CHECK MODE

     REEL POSITION MOTOR
             OFF

       MIDDLE-POSITION




        CHECK  :   (→) KEY
        CANCEL :  MENU KEY
```

```
 CHECKING
```

```
        SERVO CHECK MODE

     REEL POSITION MOTOR
             OFF

        STD-POSITION




        CHECK  :   (→) KEY
        CANCEL :  MENU KEY
```

In the case of trouble :

If the reel table does not move or the monitor display does not change, check the reel position motor, the reel MINI/M/STD position sensor (the SE-522 and DR-428 boards) and reel position motor driver circuit (the SSS-10 and DR-428 boards).

3. PLUNGER CHECK

The respective items of "PLUNGER CHECK" are described below.

```
        MAINTENANCE  MENU
SERVO  CHECK
   PLUNGER  CHECK
←      PINCH                    →
     REEL  BRAKE
     M  PLUNGER
     HEAD  CLEANER
```

```
>> Pinch
```

① PINCH

Checks the pinch roller solenoid.

1. Execute the PINCH and confirm that the pinch solenoid operates when the threading starts.
2. Press the [▲], [▼] keys to confirm that the PINCH comes to ON/OFF.
3. Press the [MENU] key to release the pinch solenoid and to bring to the unthreading.
   Doing so, the monitor display returns to the main menu.

```
     SERVO  CHECK  MODE

       PINCH  ROLLER


         PINCH   ON



  PINCH OFF  :   (↓) KEY
  CANCEL     :  MENU KEY
```

```
CHECKING
```

```
     SERVO  CHECK  MODE

       PINCH  ROLLER


         PINCH   OFF



  PINCH ON   :   (↑) KEY
  CANCEL     :  MENU KEY
```
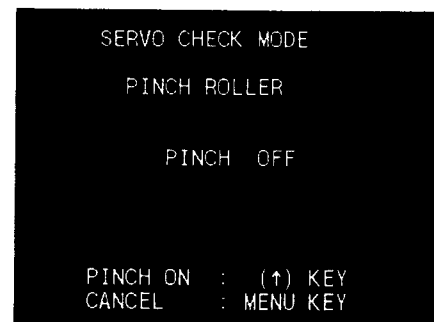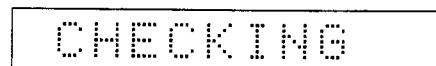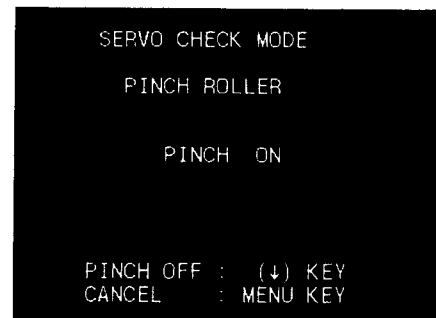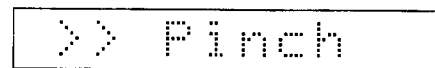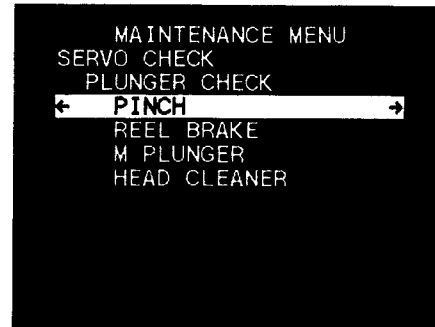
In the case of trouble :
If the pinch solenoid does not operate, check the pinch solenoid and the driver circuit (the DR-428 board).

② REEL BRAKE

Checks the reel brake solenoid.

1. Execute the REEL BRAKE and confirm that the reel brake solenoid operates.
2. Press the ▲ , ▼ keys to confirm that the REEL BRAKE comes to ON/OFF.
3. Press the MENU key to release the reel brake solenoid. Doing so, the monitor display returns to the main menu.

In the case of trouble :
If the reel brake solenoid does not operate, check the reel brake solenoid and its driver circuit (the DR-428 board).

```
        SERVO CHECK MODE

          REEL BRAKE


        REEL BRAKE   OFF




    REEL BRAKE ON :    (↑) KEY
          CANCEL : MENU KEY
```

```
CHECKING
```

```
        SERVO CHECK MODE

          REEL BRAKE


        REEL BRAKE   ON




    REEL BRAKE OFF:    (↓) KEY
          CANCEL : MENU KEY
```

③ M PLUNGER

Checks the M plunger solenoid.

1. Execute the M PLUNGER.
2. Press the ▲ , ▼ keys to confirm that the M PLUNGER comes to ON/OFF.
3. Press the MENU key to release the M plunger solenoid. Doing so, the monitor display returns to the main menu.

In the case of trouble :
If the M plunger solenoid does not operate, check the M plunger solenoid and its driver circuit (the DR-428 board).

```
        SERVO CHECK MODE

          M PLUNGER


        M PLUNGER  OFF




    M PLUNGER  ON :    (↑) KEY
          CANCEL : MENU KEY
```

```
CHECKING
```

```
        SERVO CHECK MODE

          M PLUNGER


        M PLUNGER  ON




    M PLUNGER  OFF:    (↓) KEY
          CANCEL : MENU KEY
```

5-3-4. Servo Adjust

Checks the servo system automatically or semi-automatically.

Operating procedure
1. Enter the maintenance menu.
2. Move the cursor to "SERVO ADJUST" which is displayed with a white background using the ▲, ▼ keys.

```
        MAINTENANCE MENU
MENU DATA CONTROL
EDIT CHECK
SERVO CHECK
SERVO ADJUST
TAPE PATH ADJUST
ELECTRICAL ADJUST
SERVICE SUPPORT
OTHERS
```

```
SV Adjust
```
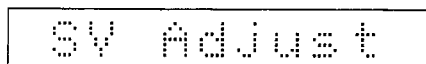
3. Press the ▶ key.
    "SERVO ADJUST" is selected and its lower-layer submenu appears.
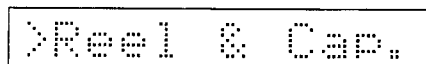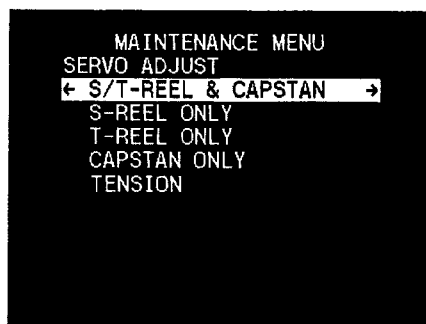
```
        MAINTENANCE MENU
SERVO ADJUST
← S/T-REEL & CAPSTAN  →
    S-REEL ONLY
    T-REEL ONLY
    CAPSTAN ONLY
    TENSION
```

```
>Reel & Cap.
```

4. Move the cursor displayed with a white background to a desired item using the ▲, ▼ keys.
5. Press the ▶ key to select the desired item.
    (Refer to the respective menu description for the adjustment procedure.)
6. Press the SET (YES) key to execute the selected menu.
7. After completing the adjustment, press the ◀ key to return to the main menu.
8. To check other menus and submenus, repeat steps 4 to 7.
9. Press the MENU key to exit the maintenance menu.

Note
If the MENU key is pressed while the adjustment is in progress, the adjustment operation is forcibly ended and the display returns to the main menu.

(1) S/T REEL & CAPSTAN

Executes the automatic adjustment of the S and T reels and, capstan systems.

1. Execute the S/T REEL & CAPSTAN.
2. After completing adjustment, confirm that "COMPLETE" appears.

Adjustment items
s reel fg duty
s reel offset/friction
s reel torque
t reel fg duty
t reel offset /friction
t reel torque
capstan fg duty

```
┌─────────────────────────────┐
│     SERVO ADJUST MODE       │
│                             │
│     CAPSTAN FG DUTY         │
│                             │
│        COMPLETE             │
│                             │
│                             │
│   ADJUST MENU :  (←) KEY    │
└─────────────────────────────┘
```

```
┌─────────────────────────────┐
│  COMPLETE                   │
└─────────────────────────────┘
```

In the case of trouble :
When "ADJUST INCOMPLETE" appears on the monitor display, check the SSS-10 and DR-428 boards (the reel FG amplifier circuit, reel motor driver circuit, capstan FG circuit and motor driver cicuit). Check also the respective motors.
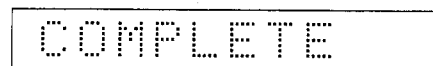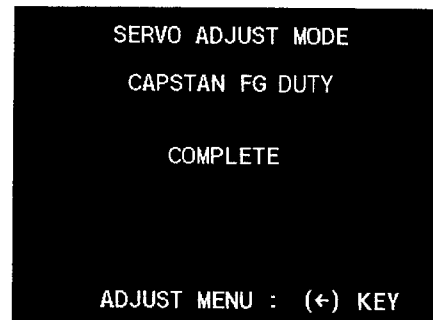
(2) S-REEL ONLY

Executes the automatic adjustment of the S reel only.

1. Execute the S-REEL ONLY.
2. After completing adjustment, confirm that "COMPLETE" appears.

Adjustment items
s reel fg duty
s reel offset/friction
s reel torque

```
┌─────────────────────────────┐
│     SERVO ADJUST MODE       │
│                             │
│     S REEL  TORQUE          │
│                             │
│        COMPLETE             │
│                             │
│                             │
│   ADJUST MENU :  (←) KEY    │
└─────────────────────────────┘
```

```
┌─────────────────────────────┐
│  COMPLETE                   │
└─────────────────────────────┘
```

In the case of trouble :
When "ADJUST INCOMPLETE" appears on the monitor display, check the SSS-10 and DR-428 boards (the reel FG amplifier circuit, the reel motor driver circuit) and the S-reel motor.
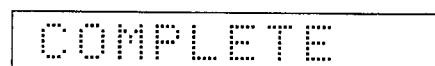
(3) T-REEL ONLY

Executes the automatic adjustment of the T reel only.

1. Execute the T-REEL ONLY.
2. After completing adjustment, confirm that "COMPLETE" appears.

Adjustment items
t reel fg duty
t reel offset/friction
t reel torque

```
SERVO ADJUST MODE

T REEL TORQUE


COMPLETE



ADJUST MENU :  (←) KEY
```

```
COMPLETE
```

In the case of trouble :
When "ADJUST INCOMPLETE" appears on the monitor display, check the SSS-10 and DR-428 boards (the reel FG amplifier circuit, the reel motor driver circuit) and the T-reel motor.

(4) CAPSTAN ONLY

Executes the automatic adjustment of the capstan FG only.

1. Execute the CAPSTAN ONLY.
2. After completing adjustment, confirm that "COMPLETE" appears.

Adjustment item
capstan fg duty

```
SERVO ADJUST MODE

CAPSTAN FG DUTY


COMPLETE



ADJUST MENU :  (←) KEY
```

```
COMPLETE
```

In the case of trouble :
When "ADJUST INCOMPLETE" appears on monitor display, check the SSS-10 and DR-428 boards (the capstan motor driver circuit, the capstan FG amplifier circuit) and the capstan motor.

(5) TENSION

Executes the adjustment of the tape tension.

Mode
PLAY mode

Tool
DV torque cassette : J-6082-373-A

1. Remove the cassette compartment.
2. Turn on the main power and press the ⌷EJECT⌷ key.
   ⌷ Note ⌷
   Make sure that the cassette compartment connection cable is
   not shorted to chassis when the main power is turned on.

3. Enter "MAINTENANCE MENU" and select "TENSION"
   from "SERVO ADJUST" using the ⌷▲⌷, ⌷▼⌷keys.
4. Press the ⌷▶⌷ key to move to the next display.

```
         MAINTENANCE MENU
SERVO ADJUST
     S/T-REEL & CAPSTAN
     S-REEL ONLY
     T-REEL ONLY
     CAPSTAN ONLY
     TENSION
```

```
>Tension
```

5. When the display appears, press the ⌷SET (YES)⌷ key to start
   the adjustment.

```
     SERVO ADJUST MODE


     START OK ?

          OK :   SET KEY
     TO MENU :  MENU KEY
```

```
>>>Start ?
```

5-26
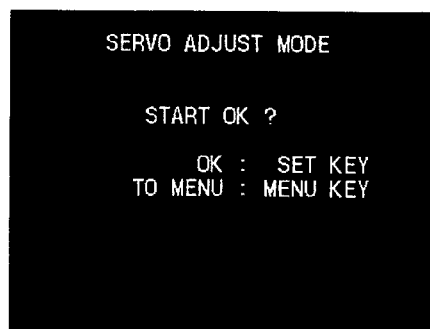
6. Wait until display changes and the menu appears as shown in the right.

```
SERVO ADJUST MODE

    TENSION


TENSION OFFSET DC
NOW ADJUSTING ...



  CANCEL : MENU KEY
```

```
ADJUSTING
```

7. Set the DV torque cassette and place a weight of about 300 g on it. Press the STOP key.

```
SERVO ADJUST MODE

    TENSION

SET TORQUE CASSETTE
(DVL40-40)
AND PUSH STOP KEY.



  CANCEL : MENU KEY
```

8. Keep pressing the ▲, ▼ keys until the DV torque cassette reading agrees with the specification value on display.
9. When adjustment is completed, press the ▶ key.

```
SERVO ADJUST MODE

    TENSION


ADJUST S REEL TORQUE
WITH (↑) OR (↓) KEY
IN RANGE OF XX.X ± Xgcm.


    NEXT :  (→) KEY
    CANCEL : MENU KEY
```

Specification is as indicated on the display.

10. The display changes as shown in the right, and the DSR-1500/1500P enters the tension regulator magnet position check mode.

```
        SERVO ADJUST MODE

              TENSION
            TENSION DC
          NOW CHECKING ...
          DATA: 0228
          (SPEC.: 01AE <--> 0252)




          CANCEL : MENU KEY
```

11. If the check is completed unsatisfactorily, the display changes as shown in the right.
12. Replace the tension regulator assembly in accordance with message on the display.

```
        SERVO ADJUST MODE

              TENSION

          DC CHECK ... NG
          DATA: 021D
          (SPEC.: 01AE <--> 0252)

          EXCHANGE THE TENSION
          REGULATOR ASSY

          ADJUST MENU :   (←) KEY
```

13. If the check is completed satisfactorily, the display changes as shown in the right.
14. Keep pressing the [▲], [▼] keys until the DV torque cassette reading agrees with the specification value on the display.
15. When adjustment is completed, press the [▶] key.
16. Repeat steps 14 and 15 to readjust the DV torque cassette reading.

```
        SERVO ADJUST MODE

              TENSION


          ADJUST S REEL TORQUE
          WITH (↑) OR (↓) KEY
          IN RANGE OF XX.X ± Xgcm.


              NEXT :   (→) KEY
              CANCEL : MENU KEY
```

Specification is as indicated on the display.

17. Confirm that the DV torque cassette reading agrees with the specification value on the display.
18. After completing step 17, press the [▶] key and the DSR-1500/1500P enters the REV mode automatically.

```
        SERVO ADJUST MODE

              TENSION


          CHECK S REEL TORQUE
          IN RANGE OF XX.X ± Xgcm.



              NEXT :   (→) KEY
              CANCEL : MENU KEY
```

Specification is as indicated on the display.

19. Keep pressing the [▲], [▼] keys until the REV holdback tension reading agrees with the specification value on the display.
20. When adjustment is completed, press the [▶] key.

```
        SERVO ADJUST MODE

            TENSION


        ADJUST S REEL TORQUE
         WITH (↑) OR (↓) KEY
        IN RANGE OF XX.X ± Xgcm.


            NEXT :  (→) KEY
            CANCEL : MENU KEY
```

Specification is as indicated on the display.

21. Press the [EJECT] key and remove the DV torque cassette.

```
        SERVO ADJUST MODE

            TENSION


        PUSH EJECT KEY.
```

22. Confirm that the message "COMPLETE" appears on the display.

```
        SERVO ADJUST MODE

            TENSION


            COMPLETE



        ADJUST MENU :   (←) KEY
```

```
COMPLETE
```

* Press the [EJECT] key to return to the ADJUST menu.
* When adjustment is complete, attach the cassette compartment.

5-3-5. Tape Path Adjust

Executes the adjustment of the tape path.

(1) TRACKING ADJUST

For adjustment of "TRACKING ADJUST", refer to Section 8-1.

(2) RF SWITCHING POSITION

For adjustment of "RF SWITCHING POSITION", refer to Section 8-3.

5-3-6. Electrical Adjust

Executes the electrical adjustment.

Operating procedure

1. Enter the maintenance menu.
2. Move the cursor to "ELECTRICAL ADJUST" which is
   displayed with a white background using the ▲, ▼ keys.

```
        MAINTENANCE MENU
MENU DATA CONTROL
EDIT CHECK
SERVO CHECK
SERVO ADJUST
TAPE PATH ADJUST
ELECTRICAL ADJUST        →
SERVICE SUPPORT
OTHERS
```

```
EL Adjust
```
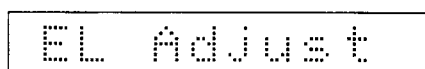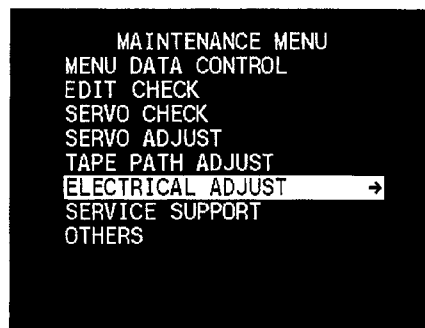
3. Press the ▶ key.
   "ELECTRICAL ADJUST" is selected and its lower layer
   submenu appears.
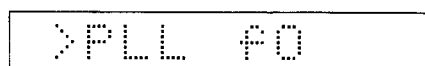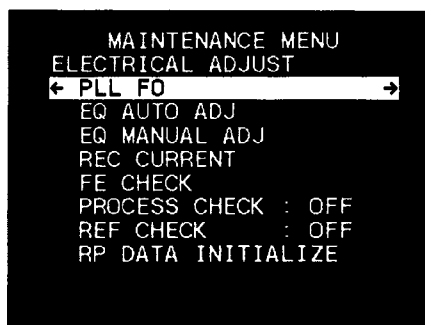
```
        MAINTENANCE MENU
ELECTRICAL ADJUST
← PLL FO                  →
   EQ AUTO ADJ
   EQ MANUAL ADJ
   REC CURRENT
   FE CHECK
   PROCESS CHECK : OFF
   REF CHECK     : OFF
   RP DATA INITIALIZE
```

```
>PLL FO
```

4. Move the cursor displayed with a white background to a
   desired item using the ▲, ▼ keys.
5. Press the ▶ key to select the desired item.

1. PLL F0

The PLL adjustment is described below :

1. Select "PLL F0" and the PLL adjustment is performed automatically.

```
 ELECTRICAL ADJUST MODE

   PLL F0 ADJUST (Pb*)


   NOW ADJUSTING ...




     CANCEL : MENU KEY
```

```
 ADJUSTING
```
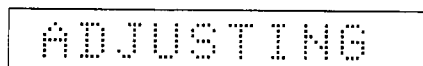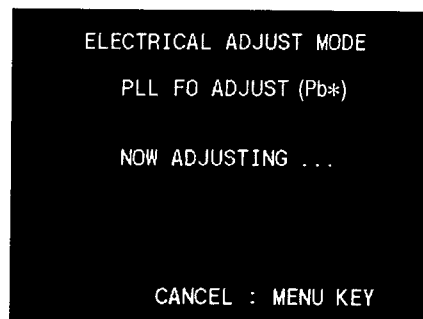
2. After completing the adjustment, confirm that "COMPLETE" appears.
3. Press the ◄ key to return to the ADJUST menu.
4. Press the MENU key to exit the maintenance menu.

```
 ELECTRICAL ADJUST MODE

    PLL F0 ADJUST


      COMPLETE




   ADJUST MENU :   (←) KEY
```

```
 COMPLETE
```
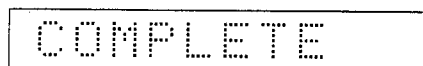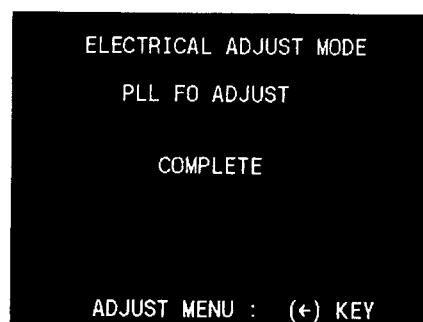
In the case of trouble :
If "INCOMPLETE" appears on the monitor display, check the
RP-117 board (the PLL circuit).

2. EQ AUTO ADJ

The EQ AUTO adjustment is described below :

① DVCAM

1. Select the EQ AUTO ADJ.

```
       MAINTENANCE MENU
ELECTRICAL ADJUST
   PLL FO
   EQ AUTO ADJ
   EQ MANUAL ADJ
   REC CURRENT
   FE CHECK
   PROCESS CHECK : OFF
   REF CHECK : OFF
   RP DATA INITIALIZE
```
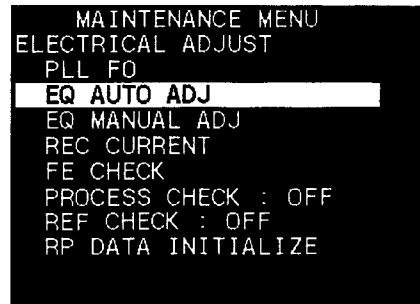
2. Move the cursor displayed with a white background to the
    DVCAM using the ▲ , ▼ keys and press the ▶ key.

```
       MAINTENANCE MENU
ELECTRICAL ADJUST
   EQ AUTO ADJ
←       DVCAM           →
        DV
        DVCPRO
```
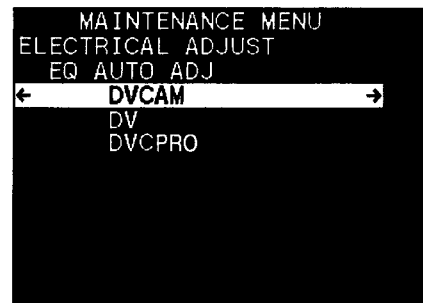
3. After the monitor display comes out as shown right, insert the
    XH5-1A2 (for NTSC) or XH5-1AP2 (for PAL) into the unit.
4. Press the PLAY key.
5. Confirm "COMPLETE" is displayed on the monitor.

```
DVCAM EQ AUTO ADJUST




SET   DVCAM TAPE
AND PUSH PLAY KEY.



    CANCEL : MENU KEY
```

To return to step 2, press the ◀ key once.
To return to step 1, press the ◀ key twice.
To return to the main menu, press the ◀ key three times.

In the case of trouble :
If "INCOMPLETE" is displayed on the monitor ;
① Send the small length of the tape forward and repeat step 2
   again.
② If "INCOMPLETE" is still displayed after performing ①,
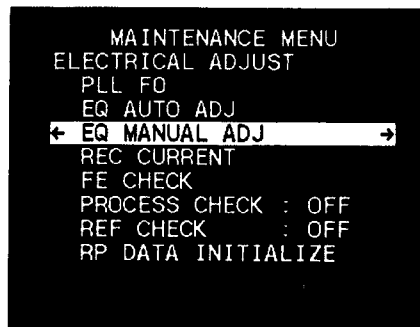   check the RP-117 board (the EQ circuit).

② DV

1. Select the EQ AUTO ADJ.

```
      MAINTENANCE MENU
ELECTRICAL ADJUST
    PLL FO
    EQ AUTO ADJ
    EQ MANUAL ADJ
    REC CURRENT
    FE CHECK
    PROCESS CHECK : OFF
    REF CHECK : OFF
    RP DATA INITIALIZE
```

2. Move the cursor displayed with a white background to the DV using the ▲ , ▼ keys and press the ▶ key.

```
      MAINTENANCE MENU
ELECTRICAL ADJUST
    EQ AUTO ADJ
        DVCAM
        DV
        DVCPRO
```

3. After the monitor display comes out as shown right, insert the XH4-1A into the unit.
4. Press the PLAY key.
5. Confirm "COMPLETE" is displayed on the monitor.

```
DV EQ AUTO ADJUST




SET  DV TAPE
AND PUSH PLAY KEY.


          CANCEL : MENU KEY
```

To return to step 2, press the ◀ key once.
To return to step 1, press the ◀ key twice.
To return to the main menu, press the ◀ key three times.

In the case of trouble :
If "INCOMPLETE" is displayed on the monitor ;
① Send the small length of the tape forward and repeat step 2 again.
② If "INCOMPLETE" is still displayed after performing ①, check the RP-117 board (the EQ circuit).

② DVCPRO

1. Select the EQ AUTO ADJ.

```
      MAINTENANCE MENU
ELECTRICAL ADJUST
   PLL FO
   EQ AUTO ADJ
   EQ MANUAL ADJ
   REC CURRENT
   FE CHECK
   PROCESS CHECK : OFF
   REF CHECK : OFF
   RP DATA INITIALIZE
```

2. Move the cursor displayed with a white background to the DVCPRO using the ▲ , ▼ keys and press the ► key.

```
      MAINTENANCE MENU
ELECTRICAL ADJUST
   EQ AUTO ADJ
     DVCAM
     DV
     DVCPRO
```

3. After the monitor display comes out as shown right, insert the DVCPRO check tape into the unit.
4. Press the PLAY key.
5. Confirm "COMPLETE" is displayed on the monitor.

```
DVCPRO EQ AUTO ADJUST




SET  DVCPRO TAPE
AND PUSH PLAY KEY.



     CANCEL : MENU KEY
```

To return to step 2, press the ◄ key once.
To return to step 1, press the ◄ key twice.
To return to the main menu, press the ◄ key three times.

In the case of trouble :
If "INCOMPLETE" is displayed on the monitor ;
① Send the small length of the tape forward and repeat step 2 again.
② If "INCOMPLETE" is still displayed after performing ①, check the RP-117 board (the EQ circuit).

3. EQ MANUAL ADJ

The EQ MANUAL ADJUSTMENT is described below :

| Note |

If any errors are found in the played back picture and audio, or if
"INCOMPLETE" is displayed after completing the EQ AUTO
ADJ in the previous section, this adjustment enables to check the
status of the RF of each HEAD.

1. Select the EQ MANUAL ADJ.

```
            MAINTENANCE  MENU
      ELECTRICAL  ADJUST
         PLL  FO
         EQ  AUTO  ADJ
    ← EQ  MANUAL  ADJ              →
         REC  CURRENT
         FE  CHECK
         PROCESS  CHECK  :  OFF
         REF  CHECK       :  OFF
         RP  DATA  INITIALIZE
```

2. Select the mode desired to check using the ▲ , ▼ keys, and
    press the ▶ key.
3. Insert the cassette of which mode you desire to check into the unit.
    DVCAM :   15 µ ADJ cassette
    DV :   10 µ ADJ cassette
    DVCPRO : DVCPRO check tape

```
            MAINTENANCE  MENU
      ELECTRICAL  ADJUST
         EQ  MANUAL  ADJ
    ←      DVCAM                    →
            DV
            DVCPRO
```
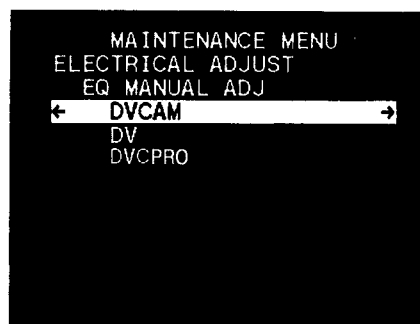
4. Press the PLAY key.
5. Press the RESET (NO) key to display asterisk mark "∗" to
    the right side of the DATA : XXXX.
6. Select the HEAD for checking with the ▶ key.
    | Note |
    The HEAD selected is displayed in the ( ) on the top of the
    monitor display.

    In the case of DVCAM :
    Main E → Main O

    In the case of DV :
    Main E → Main O

    In the case of DVCPRO :
    Main E → Main O

7. Confirm that the DATA on the screen is 0000∗ through
    000F∗.
    | Note |
    If press the SET (YES) key during confirmation, perform
    the EQ AUTO adjustment.

```
   DVCAM  EQ  ADJUST  (MAIN∗)

   MINIMIZE  THE  DATA
   WITH  (↑)  OR  (↓)  KEY.

            DATA  :  0000∗
                     LOCK
            PHASE  :  4D

            SHIFT  :  (←)(→)  KEY
      SAVE  DATA  :      SET  KEY
            ABORT  :    MENU  KEY
```
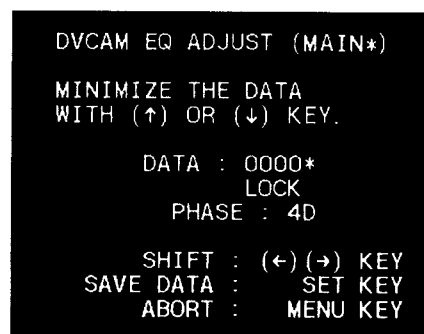
4. REC CURRENT

1. Selected the REC CURRENT.

```
        MAINTENANCE MENU
  ELECTRICAL ADJUST
    PLL FO
    EQ AUTO ADJ
    EQ MANUAL ADJ
 ← REC CURRENT           →
    FE CHECK
    PROCESS CHECK : OFF
    REF CHECK     : OFF
    RP DATA INITIALIZE
```

```
>REC  cur
```

2. Press the [▲], [▼] keys and the [◄], [►] keys to adjust the data to "C0".

```
        REC CURRENT ADJUST

            E        O
            CO       CO


     INC/DEC :  (↑)(↓)KEY
       SHIFT :  (←)(→)KEY
   DATA SAVE :    SET KEY
       ABORT :   MENU KEY
```

```
rec  E:CO
```

or

```
rec  O:CO
```

3. Press the [SET (YES)] key to save the data.

5. FE CHECK

1. Insert a blank tape.
   (Press the keys in this order : TC PRESET , RESET (NO)
   and SET (YES) keys, to set the time counter to 00, which
   facilitates the operation.)
2. Connect an oscilloscope as follows :
   Check : TP202/RP-117 board
      GND : E201
      TRIG : TP201
3. Select the FE CHECK.

```
        MAINTENANCE MENU
ELECTRICAL ADJUST
   PLL FO
   EQ AUTO ADJ
   EQ MANUAL ADJ
   REC CURRENT
← FE CHECK                    →
   PROCESS CHECK  : OFF
   REF CHECK      : OFF
   RP DATA INITIALIZE
```

```
>FE check
```
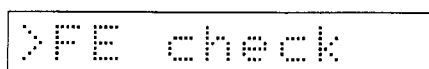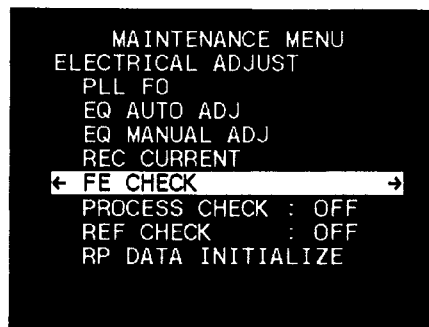
4. Select REC using the ▲ key. Press the PLAY and REC
   keys.
   After recording for 30 to 60 seconds (time counter reading),
   press the STOP key.
5. Playback the recorded segment and note down the waveform
   level.

```
T*R 00:00.00.00
   CASSETTE OUT
   REC ON   (↑:FE)
```

```
FE + REC
```
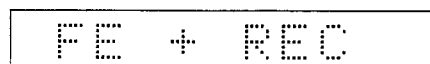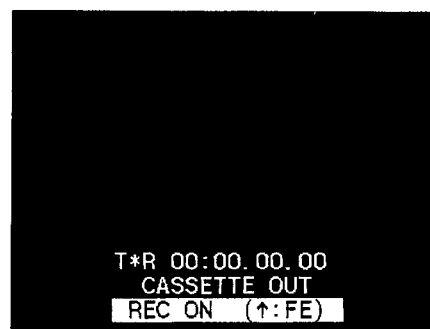
6. Select FE ONLY using the ▲ key. Locate the tape segment
   that is recorded in step "4", and press the PLAY and REC
   keys to record (i.e., erase) the recorded segment for about 30
   seconds.
7. Playback the segment recorded (erased) in step 6. and confirm
   that the waveform level is 30% or less.
   Note
   In the SY software up to version 1.11, all the area is erased. In
   the SV software of version 1.12 and higher, only the video
   sub-code is erased.

```
T*R 00:00.00.00
   CASSETTE OUT
   FE ONLY (↑:REC)
```

```
FE ONLY
```
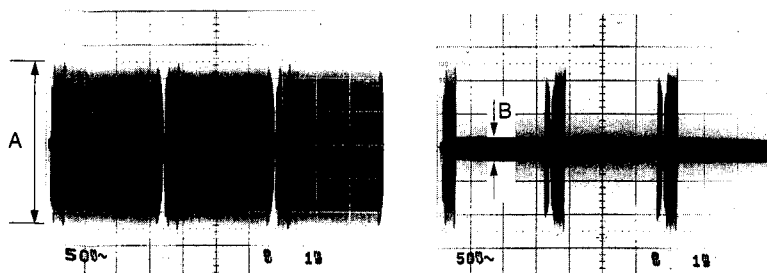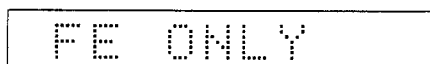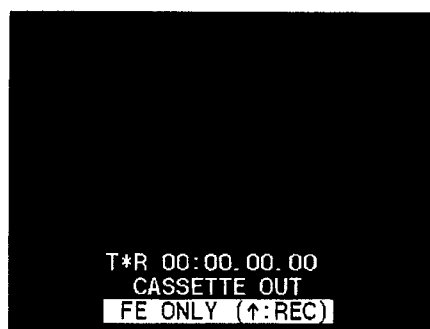

$$B \leqq A \times 0.3$$

6. PROCESS CHECK

* This menu is for the factory use only.

7. REF CHECK

* This menu is for the factory use only.

8. RP DATA INITIALIZE

1. Select the RP DATA INITIALIZE.

```
        MAINTENANCE MENU
   ELECTRICAL ADJUST
      PLL F0
      EQ AUTO ADJ
      EQ MANUAL ADJ
      REC CURRENT
      FE CHECK
      PROCESS CHECK  :  OFF
      REF CHECK      :  OFF
   ← RP DATA INITIALIZE    →
```

```
>RP  initial
```

2. As "RP DATA INITIALIZE" will be displayed on the screen, press the SET (YES) key when initializing the adjusted data.
    Note
    After initialization, be sure to perform the following three adjustments in Section "5-3-6. Electrical Adjust."
    1. PLL F0
    2. EQ AUTO ADJ
    4. REC CURRENT

```
      RP DATA INITIALIZE



      CLEAR ADJUST DATA
       AND INITIALIZE?



   ADJUST MENU :  (←) KEY
   INITIALIZE  :   SET KEY
```

```
RP  initial
```

5-3-7. Service Support

Displays the error codes and error contents which occurred in the
past and provides the diagnosis.

Operating procedure
1. Enter the maintenance menu.
2. Move the cursor to "SERVICE SUPPORT" which is displayed
   with a white background using the ▲, ▼ keys.

```
        MAINTENANCE MENU
MENU DATA CONTROL
EDIT CHECK
SERVO CHECK
SERVO ADJUST
TAPE PATH ADJUST
ELECTRICAL ADJUST
SERVICE SUPPORT          →
OTHERS
```

```
│  Support              │
```

3. Press the ▶ key.
   "SERVICE SUPPORT" is selected and its lower layer sub-
   menu appears.

```
        MAINTENANCE MENU
SERVICE SUPPORT
← ERROR LOG               →
  MANUAL EJECT

  DIAGNOSTICS CONTROL
```
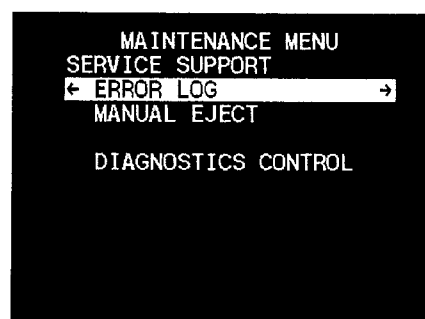
```
│  >Error  LOG          │
```

4. Move the cursor displayed with a white background to a
   desired item using the ▲, ▼ keys.
5. Press the ▶ key to select the desired item.
   (Refer to the respective menu description for the check
   procedure.)
6. After completing the check, press the MENU key to return
   to the main menu.
7. To check other menus and submenus, repeat steps 4 to 6.
8. Press the MENU key to exit the maintenance menu.

1. ERROR LOG

The errors which occurred in the past are displayed.
(The latest eight maximum errors are displayed.)

```
          MAINTENANCE  MENU
     SERVICE  SUPPORT
       ERROR  LOG
          ERROR-33-000
```

* The latest error is displayed on the top.

| Note |

The servo system errors only are stored here. The ERROR-91, 92, 93, 94 and 95 are not stored.

2. MANUAL EJECT

For the operating procedure of how to take out a tape when the EJECT is inoperable, refer to Section 4-3.

3. DIAGNOSTICS CONTROL

① CLEAR ERROR LOG

Clears the error history from the ERROR LOG.

5-3-8. Others

Enables to check the software version, keyboard and others.

Operating procedure
1. Enter the maintenance menu.
2. Move the cursor to "OTHERS" which is displayed with a white background using the ▲, ▼ keys.

```
        MAINTENANCE MENU
MENU  DATA  CONTROL
EDIT  CHECK
SERVO  CHECK
SERVO  ADJUST
TAPE  PATH  ADJUST
ELECTRICAL  ADJUST
SERVICE  SUPPORT
OTHERS
```

```
Others
```

3. Press the ▶ key.
    "OTHERS" is selected and its lower layer submenu appears.

```
        MAINTENANCE MENU
OTHERS
← SOFTWARE  VERSION    →
  DSBK-1503 SERIAL NO.
  KEYBOARD  CHECK
  MEMORY  DISPLAY
  DATA  DISPLAY
```

```
>Version
```

4. Move the cursor displayed with a white background to a desired item using the ▲, ▼ keys.
5. Press the ▶ key to select the desired item.
    (Refer to the respective menu description for the check procedure after execution.)
6. After completing the check, press the MENU key to return to the main menu.
7. To check other menus and submenus, repeat steps 4 to 6.
8. Press the MENU key to exit the maintenance menu.

(1) SOFTWARE VERSION

Displays the model information and software version numbers.

SY :   IC519 on the SSS-10 board.
SV :   IC211 on the SSS-10 board.
SP :   IC519 on the SSS-10 board.
DR :   IC1 on the DR-428 board.
KY :   IC102 on the KY-484 board.
DVIO :   IC602 on the DV-25 board.
SDI :   IC903 on the SDI-58 board.
MENU : IC8 on the DR-428 board.

```
   SOFTWARE  VERSION

        DSR-1500P

SY:  V1. 08    DVIO:  V0. 70
SV:  V1. 06    SDI  :  V0. 5
SP:  V1. 07    MENU:  V1. 0
DR:  V0. 905
KY:  V0. 31


   TO MENU  :  MENU KEY
```

Press the ▶ key to display the version below.
SMART : IC401 on the SSS-10 board.
V2P :   FU-78AP (A-8326-487-A)
V2R :   FU-78AR (A-8326-486-A)
NSG :   IC510 on the AVP-3/3P board.
ACTL :   IC300 on the DVP-19 board.
SIFP :   IC902 on the DVP-19 board.
SIFR :   IC600 on the DVP-19 board.
SIFE :   IC601 on the DVP-19 board.
AIF :   IC1002 on the DVP-19 board.
AIFI :   IC202 on the DV-25 board or IC602 on the SDI-58 board.

```
   SOFTWARE  VERSION

        DSR-1500P

SMART:  V1. 02    SIFP:  V1. 3
V2P  :  V3. 2     SIFR:  V1. 1
V2R  :  V3. 2     SIFE:  V1. 3
NSG  :  V2. 2     AIF  :  V1. 1
ACTL :  V1. 0     AIFI:  V1. 1


   TO MENU  :  MENU KEY
```

* The message NONE appears for the DVIO, SDI and AIFI version when the optional board is not installed in the DSR-1500/1500P.
* When both the DSBK-150L (SDI-58 board) and DSBK-1503 (DV-25 board) are attached, the version of IC602 side on the DSBK-1501 (SDI-158 board) is displayed as the AIFI version.
* Contents which are shown in the time counter display can be changed using the ▲ , ▼ keys.
* Press the ◀ key or the MENU key to return to the maintenance menu.

(2) MEMORY DISPLAY

* Factory use only.

(3) DATA DISPLAY

* Factory use only.

Section 6
Periodic Inspection and Maintenance

6-1. Periodic Inspection List

The following table shows the reference parts replacement time which is not the warranty time of parts.
Refer to the following table to establish the periodic inspection schedule which realizes the full performance and function of a unit and to extend life of a tape. The actual parts replacement period depend on the operating environment and conditions of a unit.

☆ : Part replace   ◇ : Check (Adjustment)   ○ : Cleaning

Inspection items			Hours meter	Inspection time (Hours)			
Item	Part No.	Name	Menu No.	2000	4000	6000	8000
Drum assembly	A-8320-778-B	DEH-13B-R	T2	☆	☆	☆	☆
Tape drive system blocks							
Pinch solenoid	A-8279-203-	Pinch Solenoid assembly	T2	◇	◇	◇	◇
Brake solenoid	1-454-930-11	Plunger solenoid	T2	◇	◇	◇	◇
Reel motor (T)	8-835-636-51	DC motor (SRD14A/J-RP)	T2	◇	◇	◇	◇
Reel motor (S)	8-835-637-51	DC motor (SRD15A/J-RP)	T2	◇	◇	◇	◇
Loading motor	A-8279-202-	LD motor assembly	T2	◇	◇	◇	◇
Reel sift motor	A-8279-204-	RS motor assembly	T2	◇	◇	◇	◇
T reel brake shoe	A-8324-480-	Brake (T) assembly	T2	◇	◇	◇	◇
S reel brake shoe	A-8324-481-	Brake (S) assembly	T2	◇	◇	◇	◇
Head cleaner solenoid	1-454-942-11	Plunger solenoid	T2	–	–	–	◇
M stop solenoid	1-454-932-11	Plunger solenoid	T2	–	–	◇	◇
Tape path system blocks							
Capstan motor	8-835-619-51	DC motor (SCD16A/J-RP)	T2	◇	◇	◇	☆
Pinch roller	A-8279-201-	Pinch limiter assembly	T2	☆	☆	☆	☆
Guide roller T2	A-8279-024-	Shuttle (R) assembly	T2	○	○	○	◇○
Guide roller T3	A-8279-026-	T drawer arm assembly	T2	○	○	○	◇○
Guide roller T4	A-8279-400-	TG-8 arm assembly	T2	○	○	○	◇○
Guide roller S2	A-8279-023-	Shuttle (L) assembly	T2	○	○	○	◇○
Guide roller S3	A-8323-655-	Tension regulator assembly	T2	○	○	○	◇○
Guide roller S4	A-8279-399-	TG-1 arm assembly	T2	○	○	○	◇○
Tape running surface (including tape cleaner)	——	——	——	○	○	○	○
Head cleaner	X-3605-665-1	HC roller assembly		☆	☆	☆	☆
Others							
Cassette memory terminal	A-8323-659-	MIC holder assembly	T2	◇○	◇○	◇○	◇○

T2 : DRUM ROTATION

6-2. Hours Meter

The hours meter data is displayed on the monitor display and the time counter display area.
Therefore, the hours meter data cannot be checked without turning on the main power to the unit.
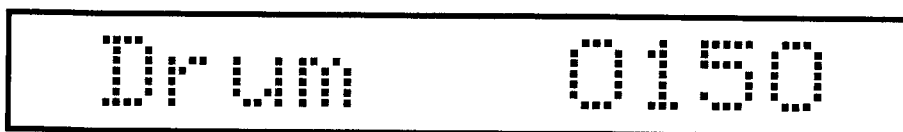Periodic inspection is recommended to be performed using the hours meter reading.

HOURS METER

```
┌─────────────────────────────────────┐
│                                      │
│    HOURS  METER                      │
│                                      │
└─────────────────────────────────────┘
```

The hours meter has the four types of display mode. The accumulated elapsed hours of operation or accumulated times of operation are displayed in the respective modes. The T2, T3 and CT modes have both of resettable accumulation counter and un-resettable accumulation counter.

| Note |

The actual hours and times are obtained by multiplying the displayed number by 10.

Modes	Contents of display
T1 : OPERATION	Accumulated hours of power on
T2 : DRUM ROTATION	Accumulated hours of drum rotation at the threaded-end position
T3 : TAPE RUNNING	Accumulated hours of tape running in the respective modes of fast forward, rewind, playback, search, record and edit (except for the still mode during search)
CT : THREADING	Numbers of times of threading and unthreading

Example : The following display indicates that the accumulated hours of drum rotation at the threaded-end position is 1500 hours.

```
┌─────────────────────────────────────┐
│                                      │
│   Drum          0150                 │
│                                      │
└─────────────────────────────────────┘
```

6-2-1. Displaying Hours Meter Information

1. Press the |MENU| key on the front panel.

Front panel
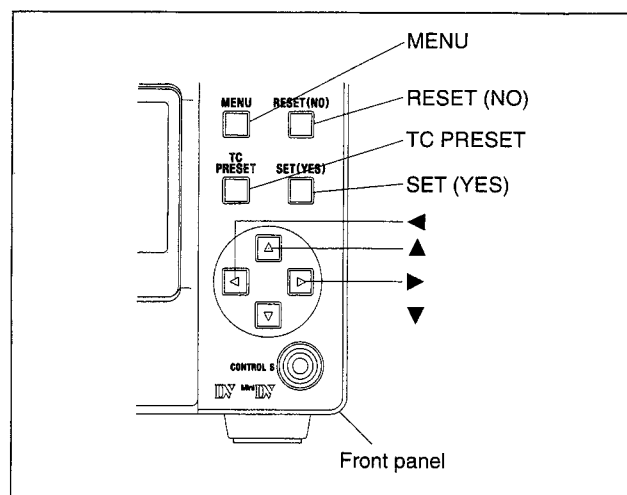
2. Select HOURS METER using ▲, ▼ keys, and press the ▶ key.
3. All of the hours meter information of T1, T2, T3 and CT appear on the monitor screen.
4. Either one of T1, T2, T3 or CT is displayed on the time counter display area. Select another item using the ▲, ▼ keys.
5. When the mode of T2, T3 or CT is selected, the resettable hours meter value appears first.
6. The un-resettable hours meter value is displayed while the ▶ key is kept pressed.

   | Note |

   When the hours meter value becomes larger and exceeds the limit of display, " —————— " will appear.
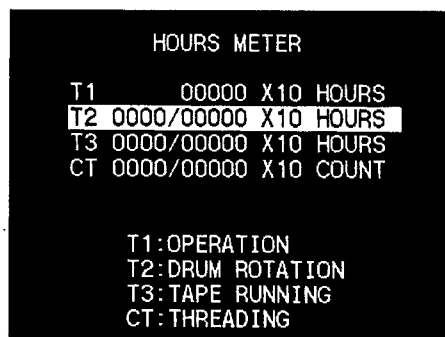
7. Press the |MENU| key again to return to the original mode.

[Monitor screen]


```
          HOURS METER

T1          00000 X10 HOURS
T2 0000/00000 X10 HOURS
T3 0000/00000 X10 HOURS
CT 0000/00000 X10 COUNT


      T1:OPERATION
      T2:DRUM ROTATION
      T3:TAPE RUNNING
      CT:THREADING
```

[Counter display area]
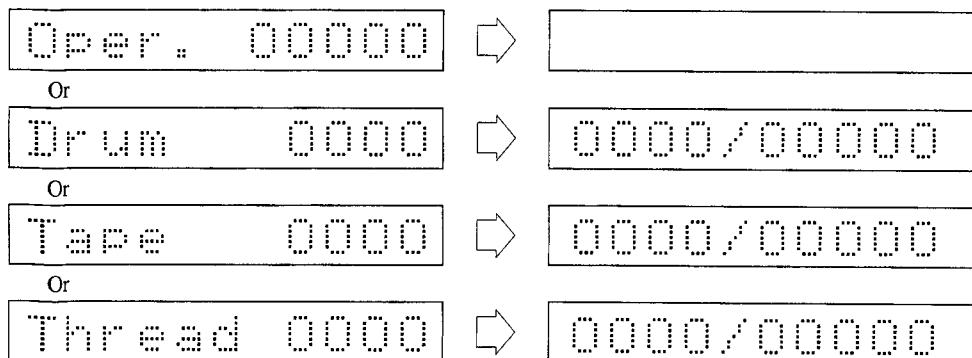
6-2-2. How to Reset Hours Meter

1. Set the switch S400-1 on the SSS-10 board to ON.
2. Press the [MENU] key.
3. Select HOURS METER using [▲], [▼] keys, and press the [►] key.
4. Select the desired item to reset using [▲], [▼] keys.
5. When the [RESET (NO)] key is pressed, the display changes to "0000" which blinks.
6. When the [SET (YES)] key is pressed, a message appears requesting approval to reset, on the monitor.
7. To reset the memory, press the [SET (YES)] key again to exit the hours meter display mode.

   Note

   The following message appears while saving data into memory during reset.
   If the main power is turned off while the message appears, the memory will not be reset correctly. Do not turn off the main power while the display appears.

```
       HOURS  METER

         T2,  --,  --

          RESET  OK  ?


   NO    KEY  :  CANCEL
   YES   KEY  :  RESET
   MENU  KEY  :  ABORT  &  EXIT
```

```
   Reset OK ?
```

8. Set the switch S400-1 on the SSS-10 board to OFF.

```
       HOURS  METER

         NOW  SAVING ...



```

```
   Saving...
```
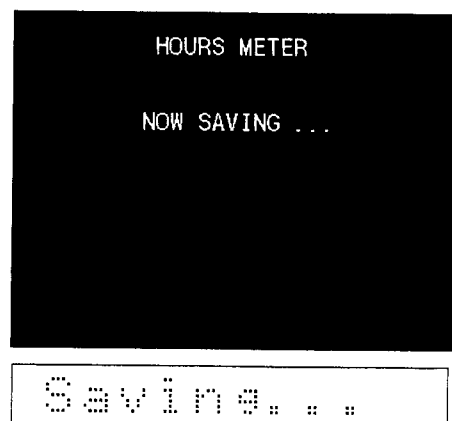
6-3. Maintenance upon Completion of Repair

Perform the following maintenance work regardless of the operating hours of the unit, after repairing it.

1. Video head cleaning
   (Refer to Section 6-3-1 for cleaning procedure.)
2. Tape running path cleaning
   (Refer to Section 6-3-2 for cleaning procedure.)

| Note |

After a unit is cleaned, insert a cassette after cleaning fluid is dried completely.

6-3-1. Video Head Cleaning Procedure

Bring a cleaning cloth moistened with cleaning fluid in contact with the head tip gently, and rotate the drum slowly with hand for cleaning.

Cleaning cloth
Drum
Video heads
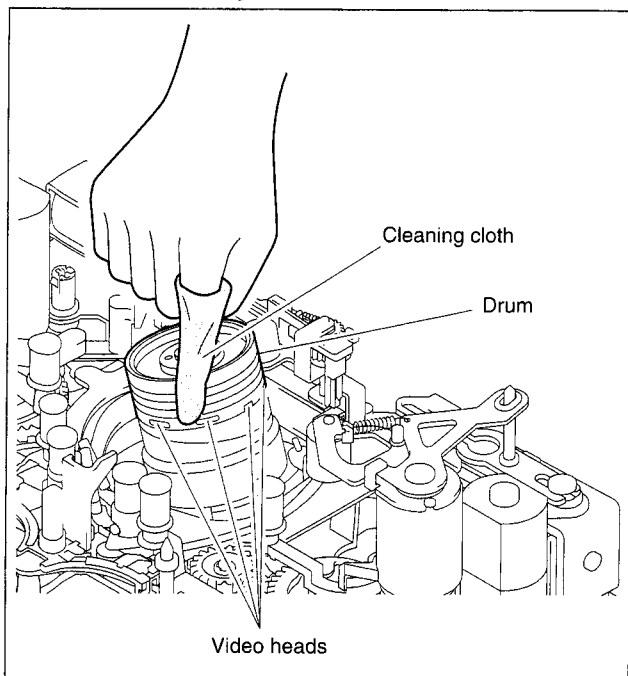
| Notes |

* Never move the cleaning cloth in vertical direction with respect to the drum rotation (up and down with respect to the drum) during cleaning.
* After cleaning, wipe off moisture using a dry cleaning cloth.
* Turn off the main power before cleaning a unit.

6-3-2. Tape Running Path Cleaning

Clean the tape guide, drum, capstan, pinch roller, tape cleaner and other parts which contact with video tape, with cleaning cloth moistened with cleaning fluid.

| Notes |

* Be careful of the tape cleaner during cleaning because it has sharp edge.
* After cleaning, wipe off moisture using a dry cleaning cloth.

Tape cleaner
(Sharp edge)
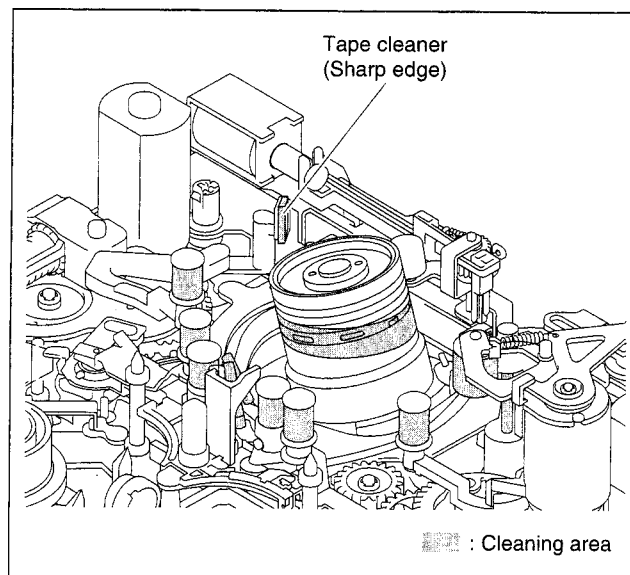
: Cleaning area

6-3-3. Cassette Compartment Entrance Cleaning

Clean the area around the cassette guide of the front panel and entire surface of the stage of the cassette compartment as shown using cleaning cloth moistened with cleaning fluid.

Note

Remove the cassette compartment when cleaning a unit to prevent foreign materials from dropping into a unit.

Entire surface of stage
(Cleaning)

Cassette compartment

Cassette guide area
(Cleaning)
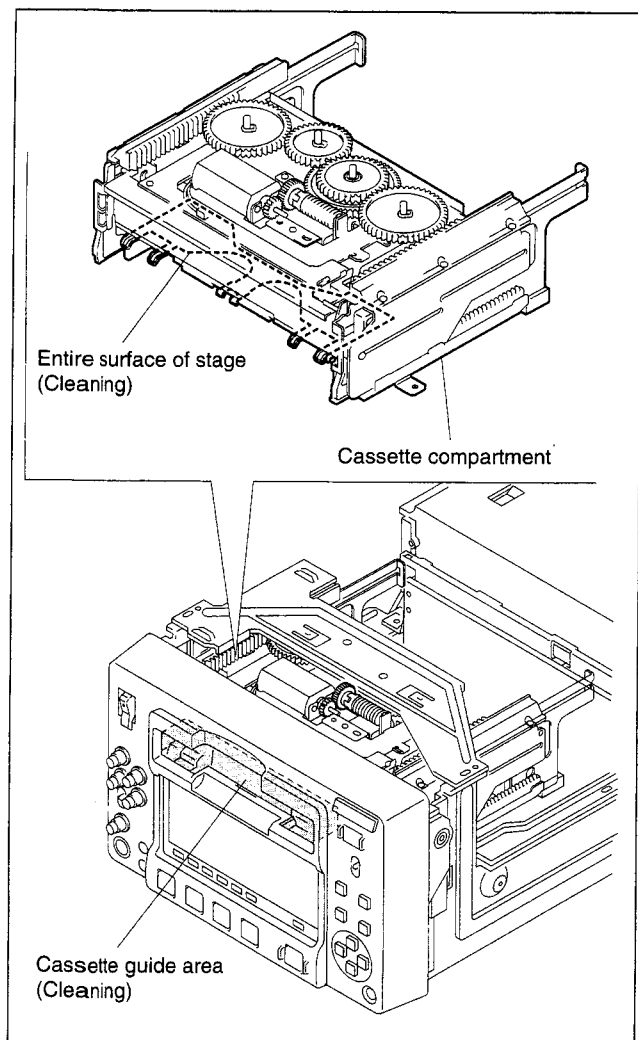
6-3-4. Cassette Compartment Shaft Cleaning

Turn the gear (red) in the arrow direction until you can see the shaft. Clean the shaft with a cleaning cloth moistened with a cleaning fluid.

Shaft

Gear (red)
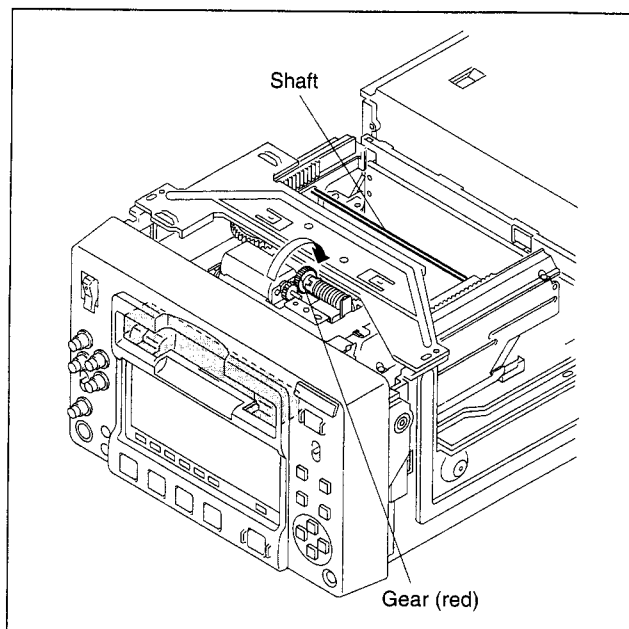
6-3-5. Cassette Guide Assembly Cleaning

Clean the rear block of the cassette guide assembly with a cleaning cloth moistened with a cleaning fluid.

Rear block of the cassette guide assembly

Front panel block
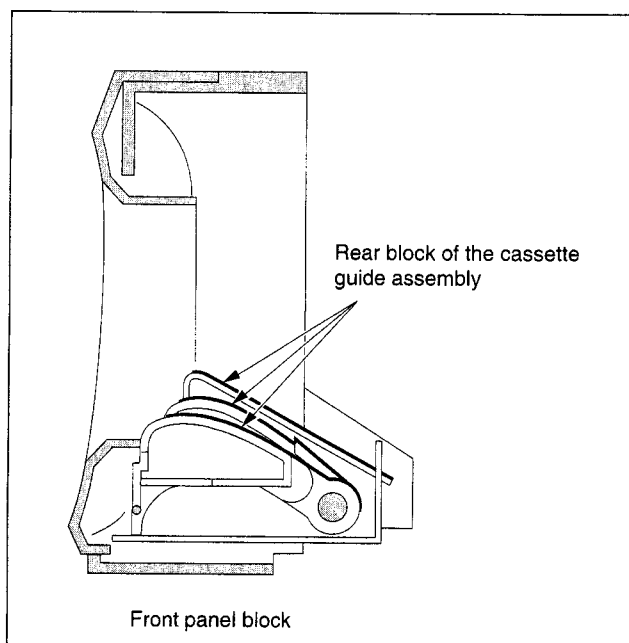
Section 7
Replacement of Mechanical Parts

7-1. General Information on Parts Replacement and Adjustment

7-1-1. Preparation Before Starting Parts Replacement

• Remove the ornamental parts as needed.
• When replacing parts or performing mechanical adjustment, remove the cassette compartment from the DSR-1500/1500P not so far as specified. (Refer to Section 3-4.)
• When the connector of the cassette compartment is removed, the protection circuit starts functioning. Refer to section "4-3-3. Operating the VTR without a Cassette Tape." to operate the DSR-1500/1500P without the cassette compartment.

7-1-2. Drum Assembly

• The drum assembly is a periodic replacement part. The drum should be replaced in accordance with the periodic replacement list.
• The drum assembly must be replaced in the following cases :
(1) When the video heads are worn out so that the proper tape-to-head contact is lost and recording and playback cannot be performed correctly;
(2) When the rabbet guide of the lower drum is worn out so that the correct RF envelope cannot be obtained even after adjusting the tape path to optimize the tracking.
(3) When the rabbet guide or tape running surface of the lower drum is damaged;
(4) If the drum rotation is abnormal and the VTR does not work properly due to noise or jitter.

7-1-3. Grease

Be sure to use only the authorized grease.
If grease other than the authorized one is used, major malfunctions may result due to differences in grease viscosity and its ingredients.
If grease containing dirt is used, the shafts and bearings may be damaged and major malfunctions may result.

Use the following grease for the DSR-1500/1500P :

Grease (SG941 (20 g)) : 7-662-001-39

• Do not apply grease to any parts other than the specified parts.
• Apply just enough grease to cover a coating on the surface.
  Wipe off any grease that oozes out into the surrounding parts with gauze or a soft cloth.

7-1-4. Tightening Torque and Handling of Washers

1. Screwdrivers and Tightening Torque of Screws

Many M1.4 and M2 screws are used in the DSR-1500/1500P.
Be sure to use the authorized tools to loosen and tighten them.
In addition, use a torque screwdriver to tighten the screws with the specified tightening torque.

Torque screwdriver bit (for M 1.4) :	J-6325-110-A
Torque screwdriver bit (for M 2) :	J-6325-380-A
Hexagon bit (for torque screwdriver) :	J-6326-120-A
Torque screwdriver (for 3 kgf•cm) :	J-6325-400-A

Tightening torque
For M1.4 screw :	0.1 N•m (1.0 kgf•cm)
For M2 screw :	0.2 N•m (2.0 kgf•cm)

Note

The DSR-1500/1500P uses many small screws that easily fall inside the machine when removing and re-assembling parts. To avoid this risk, magnetize the screwdriver bit slightly enough to prevent small screws from falling into the machine. However, when installing the drum assembly, never use a magnetized screwdriver.

2. Stop Washer and E ring

Do not use old stop washers and E rings that have been removed.
Always use new stop washers and E ring to attach the parts.

Stop washer (1.5) :	3-669-465-01
Stop washer (2.3) :	3-669-596-01
E ring (2.3) :	7-624-105-04
Cotter polyethylene washer :	3-321-813-01
Polyslider washer (Ø2.0) :	3-701-437-01

How to Remove the Stop Washers and E ring
(a) Use the following fixtures to remove stop washers and E ring.
Washer extracting fixture (A) : J-6082-234-A
Note
• Be careful not to drop the stop washers and E ring inside the DSR-1500/1500P.
• Be careful not to let tools touch other parts, especially the drum.

How to Attach the Stop Washers
Use the following tools to attach stop washers :
Washer mounting fixture Ø1.5 : J-6082-231-A
Washer mounting fixture Ø1.2 : J-6082-232-A
Washer mounting fixture Ø0.8 : J-6082-233-A

(a) Insert a stop washer to the tip of the washer mounting fixture.
(b) Set the thin tip of the mounting fixture perpendicularly to the top of the shaft to which the stop washer is to be installed.
(c) Press the thick portion of the fixture downward to install the stop washer onto the shaft.

Washer mounting ficture

Stop washer

Stop washer
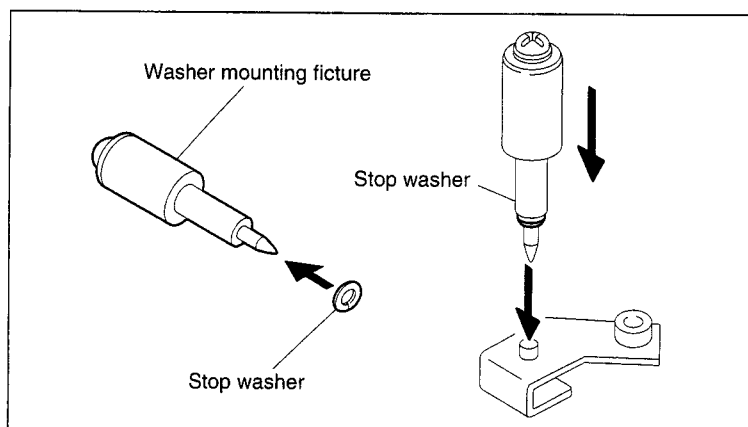
7-2. Drum Replacement

Outline

Replacement
Disconnecting the connectors
Removing the head cleaner assembly
Replacing the drum assembly
Reattaching the head cleaner assembly
Reconnecting the connectors
Cleaning the heads and tape running surface

Adjustment after replacement
Tape path adjustment
RF switching position adjustment
EQ adjustment

Note

Take care not to damage the tape guides around the drum assembly, tape running surface on the drum, video heads of the drum assembly and so on when replacing the drum assembly.

Basic Knowledge

Besides the periodic replacement, replace the drum assembly in the following cases.
• When no proper RF waveform can be obtained even if tracking adjustment is performed.
• When the damaged tape running surface on the drum cannot be recovered.

Preparations

1. Set the unit into the unthreading end status.
2. Power off the unit.
3. Remove the top plate. (Refer to Section 3-3.)
4. Remove the bottom plate. (Refer to Section 3-3.)
5. Remove the cassette compartment assembly. (Refer to Section 3-4.)

Tool

• Cleaning cloth :	3-184-527-01
• Cleaning fluid :	9-919-573-01
• Torque screwdriver bit (for M1.4) :	J-6325-110-A
• Torque screwdriver (for 3 kgf•cm) :	J-6325-400-A

1. Disconnecting the connectors

(1) Remove the harnesses and flexible card wires that are connected to the two connectors (CN10, CN12) on the DR-428 board of the back of the chassis.

(2) Remove the flexible card wire connected to the connector (CN102) on the RP-117 board.

| Note |

When disconnecting the connector, take extra care not to injure your hands with the chassis, etc.

CN10

CN102

RP-117 board

CN12
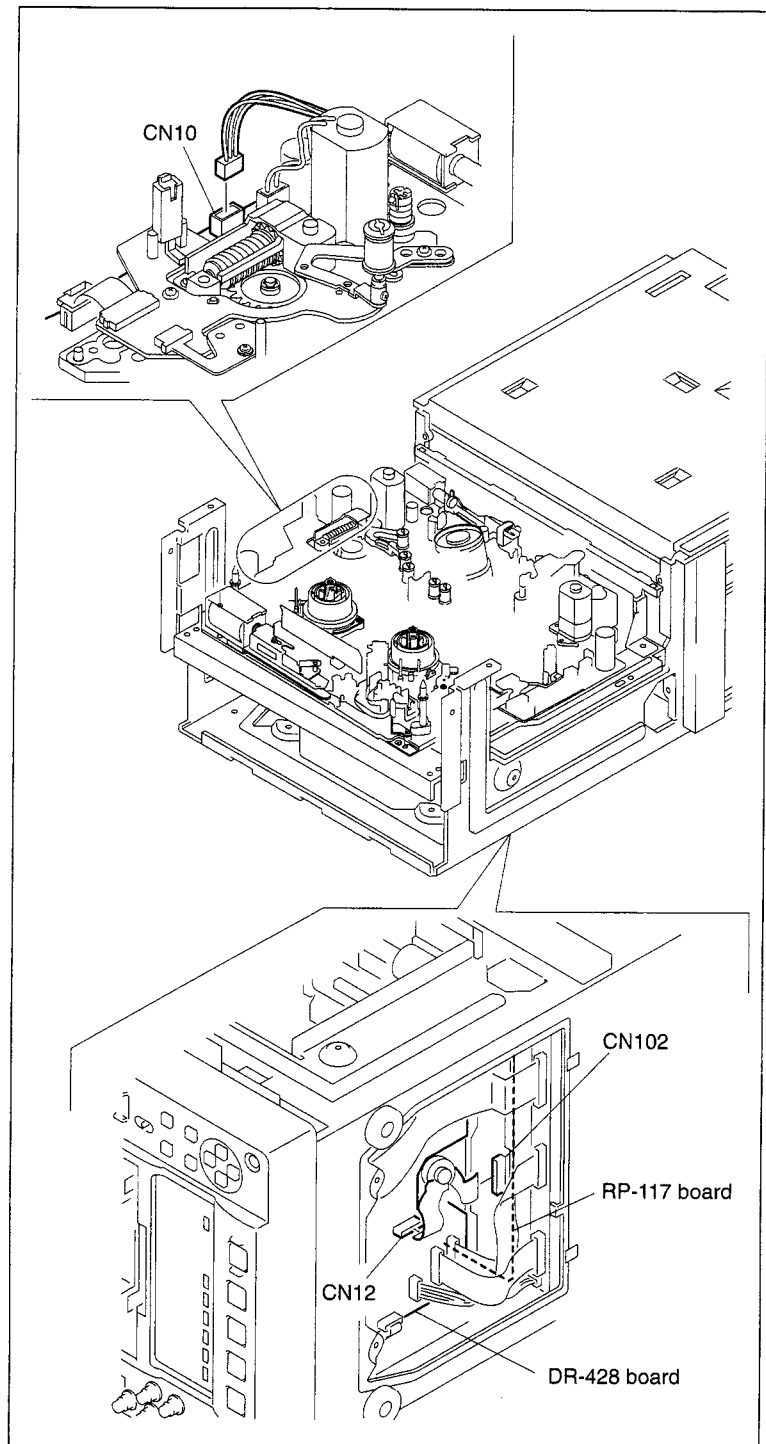
DR-428 board

2. Removing the head cleaner assembly

(1) Disconnect the harness from the connector (CN11) on the DR-428 board with tweezers.

(2) Remove the two screws, and remove the head cleaner assembly in the direction of the arrow.

P1.4 x 3.5
Head cleaner assembly
P1.4 x 3.5
CN11
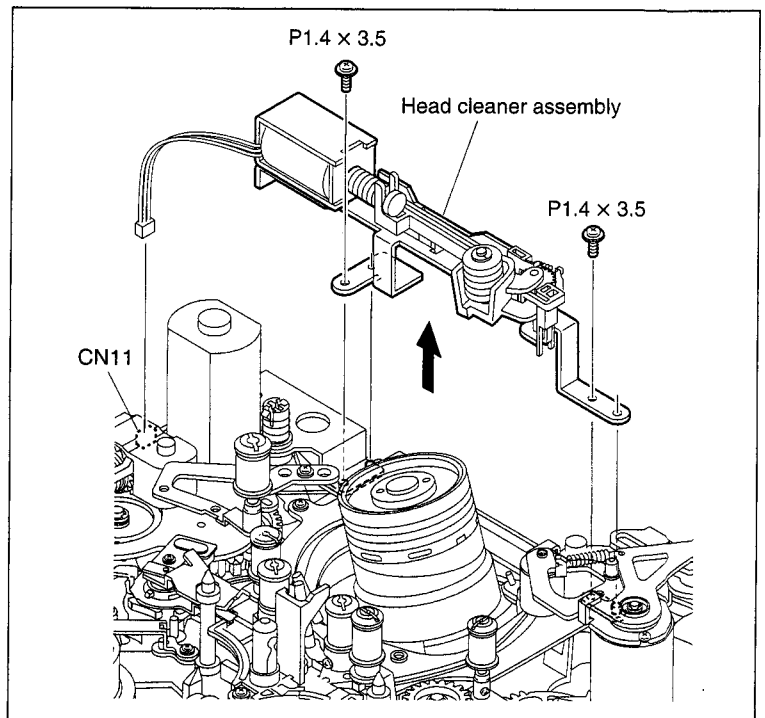
3. Replacing the drum assembly

(1) Remove the three screws, and remove the drum assembly from the MD chassis.

Note

Take care not to contact the drum assembly to the peripheral tape guides.

(2) Clean the installation surfaces of a new drum assembly and MD chassis with a cleaning cloth moistened with cleaning fluid.

(3) Put the five flexible card wires into the hole on the MD chassis, and align the two positioning pins on the MD chassis with the holes of the drum assembly.

(4) While moving the drum assembly in the direction of the arrow (counterclockwise direction), tighten the three screws in the order of (a), (b), (c).

Tightening torque : 0.1 N•m {1 kgf•cm}

P1.4 x 3.5 (c)
P1.4 x 3.5 (a)
Positioning hole
P1.4 x 3.5 (b)
Positioning hole
Drum assembly
Cleaning
Positioningpin
Cleanin
Hole
Positioning pin
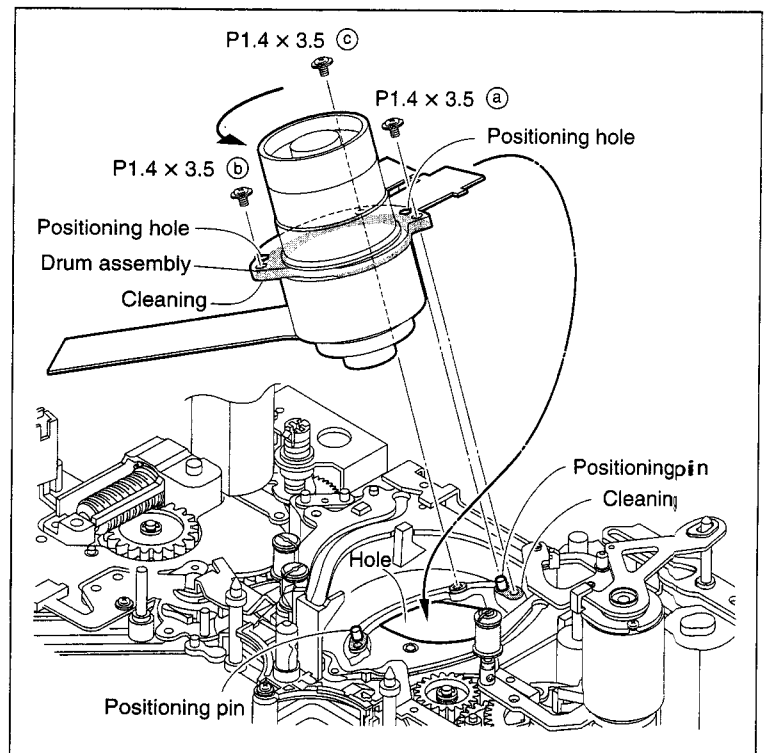
4. Reattaching the head cleaner assembly

(1) Align the positioning hole of the head cleaner assembly with the positioning pin on the MD chassis, and reattach it with the two screws.
Tightening Torque : 0.1 N•m {1 kgf•cm}

(2) Reconnect the harness to the connector (CN11) on the DR-428 board.

| Note |

• Use care not to contact the head cleaner assembly with the tape running surface on the drum.
• Do avoid touching the HC roller assembly with bave hands.

P1.4 × 3.5
Iron core
Head cleaner assembly
HC roller assembly
P1.4 × 3.5
Positioning hole
Positioning pin
Positioning hole
CN11
Positioning pin
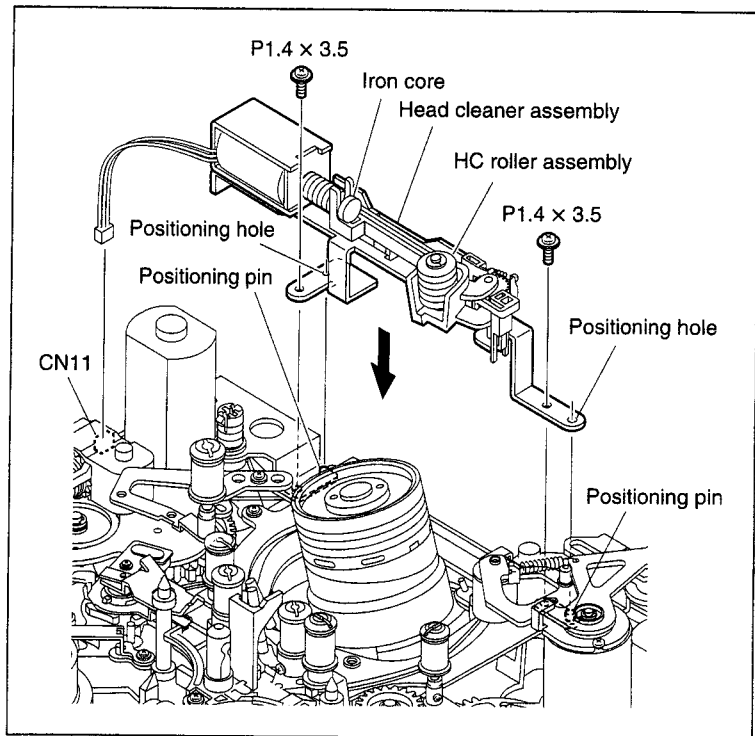
5. Connecting the connectors

(1) Connect the harnesses and flexible card wires to the two connectors (CN10, CN12) on the DR-428 board of the back of the chassis.

(2) Connect the flexible card wire to the connector (CN102) on the RP-117 board.

6. Cleaning the heads and tape running surface

Clean the tape running surfaces of the drum and video heads with cleaning cloth moistened with cleaning fluid.

Adjustment after Replacement

7. Tape path adjustment

(Refer to Section 8-2.)

8. RF switching position adjustment

(Refer to Section 8-3.)

9. EQ adjustment

(Refer to Section 5-3-6.)
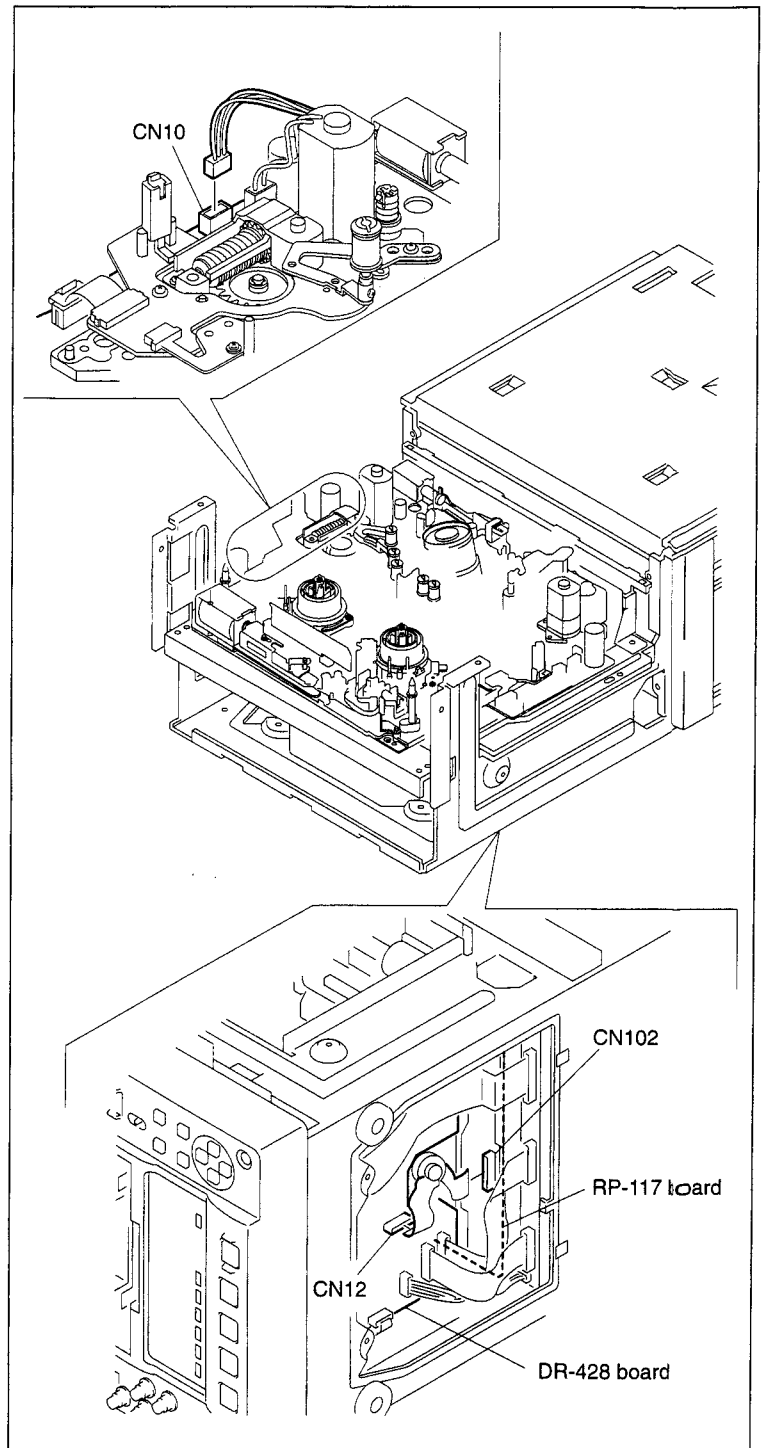
7-3. S/T Brake Assembly Replacement

Outline

Replacement

Moving the S/T reel tables
Removing the L push plate (only when replacing the T-side brake assembly)
Removing the MIC assembly (only when replacing the T-side brake assembly)
Removing the reel cover
Replacing the brake assembly
Checking and adjusting the brake torque
Reattaching the reel cover
Reattaching the MIC assembly (only when replacing the T-side brake assembly)
Reattaching the L push plate (only when replacing the T-side brake assembly)

Note

- Prepare a new cotter polyethylene washer when replacing the brake assembly.
  Cotter polyethylene washer (1.5) : 3-321-813-01
- Be careful not to lose the polyslider washer between the base plate and the MIC assembly.
- When replacing the T-side brake assembly, prepare a new stop washer for mounting the MIC assembly.
  Stop washer (1.5) : 3-669-465-01 × 1 (for mounting the MIC assembly)

Preparation

1. Set the unit to the unthreading end status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)
4. Remove the cassette compartment. (Refer to Section 3-4.)

Tools

- Brake torque gauge (CCW) :   J-6443-710-A
- Brake torque gauge (CW) :   J-6443-720-A
- Torque screwdriver's bit (for M1.4) : J-6325-110-A
- Torque screwdriver's bit (for M2) :   J-6325-380-A
- Torque screwdriver (for 3 kgf•cm) :   J-6325-400-A
- Washer extracting fixture (A) :   J-6082-234-A
- Washer mounting fixture Ø1.5 :   J-6082-231-A
- Cleaning cloth :   3-184-527-01
- Cleaning fluid :   9-919-573-01
- Tweezers

Replacement

1. Moving the S/T reel tables

Turn the reel shift motor gear by a skewer to bring the S/T reel tables to the standard cassette position. (Refer to Section 7-19.)

2. Removing the L push plate (only when replacing the T-side brake assembly)

Remove the two screws to remove the L push plate.

3. Removing the MIC assembly (only when replacing the T-side brake assembly)

Remove the MIC assembly.
(Refer to Section 7-19.)
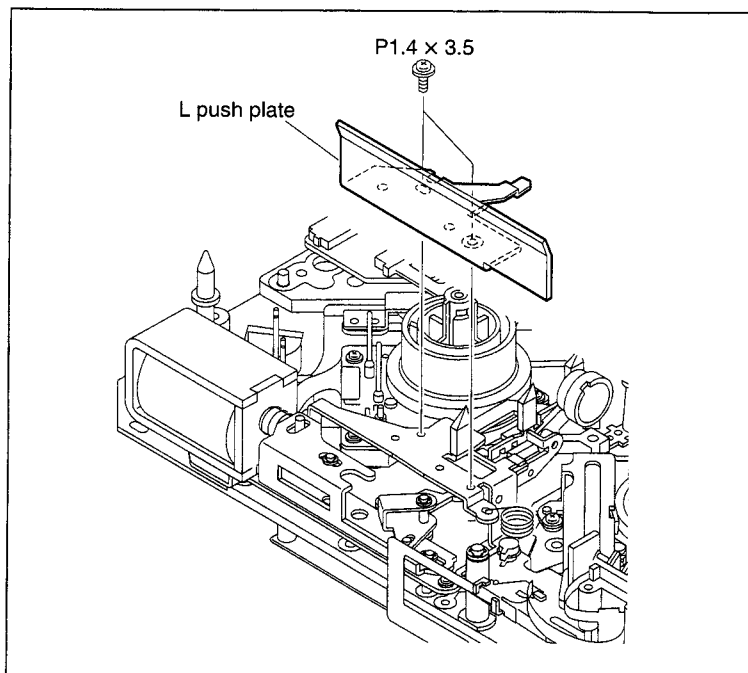
4. Removing the reel cover

Remove the screw, and then release the two claws to remove the reel cover S or T.
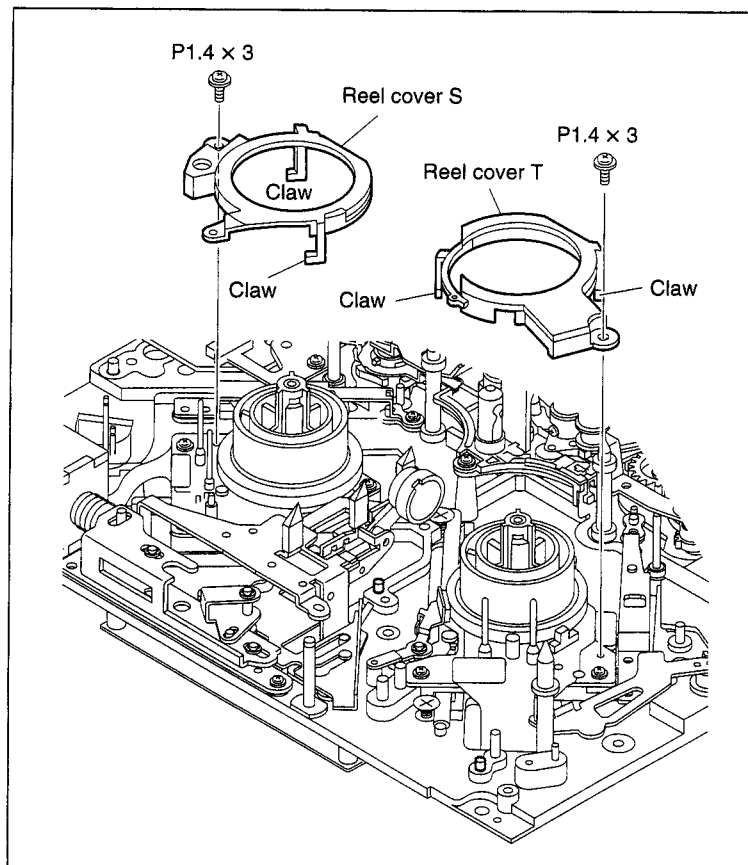
5. Replacing the brake assembly

(1) Remove the cotter polyethylene washer and remove the brake assembly and the brake springs S/T.

Note

Use care to prevent the brake spring from flying off when removing.
The polyslider washer located under the brake spring may come off together with the brake spring, therefore be careful not to lose it.
If it comes off, return it in place.

(2) Wipe the contact surface on the reel table against the brake assembly with a cleaning cloth moistened with cleaning fluid.

(3) Join the brake spring to a new brake assembly as shown in the figure and fit it on the reel motor shaft.

Note

Avoid touching the brake shoe when replacing.

(4) Attach a new cotter polyethylene washer

Brake assembly (S)
Cotter polyethylene washer
Brake shoe
Brake spring (S)
Polyslider washer
Brake assembly (T)
Cotter polyethylene washer
Brake shoe
Reel table (T)
Cleaning
Brake spring (T)
Polyslider washer
Reel table (S)
Cleaning

Brake spring hook on portion b

Brake spring hook on portion b
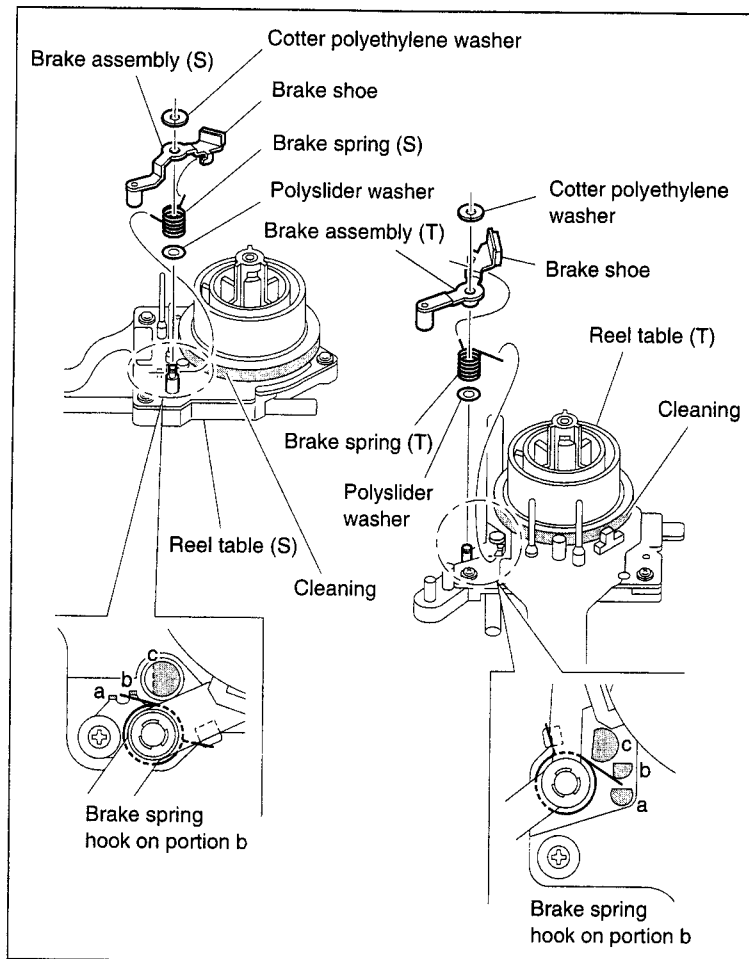
6. Checking and adjusting the brake torque

(1) S reel brake torque
Check the S reel brake torque meets the specification below by turning the knob of the brake torque gauge (CW) in the A direction a turn in 1 to 3 seconds.
Tightening Torque : 7.5 ±0.5 m N•m
{75 ±5 gf•cm}

(2) T reel brake torque
Check the T reel brake torque meets the specification below by turning the knob of the brake torque gauge (CCW) in the B direction a turn in 1 to 3 seconds.
Tightening Torque : 7.5 ±0.5 m N•m
{75 ±5 gf•cm}

(3) Failing satisfaction of the specification, readjust by changing the positon that the brake spring hooks on. (Refer to setp 6.)
• If the torque is high, hook the brake spring on the c portion.
• If the torque is low, hook the brake spring on the a portion.

Brake torque gauge (CW)
Reel table (S)
A

Brake torque gauge (CCW)
B
Reel table (T)
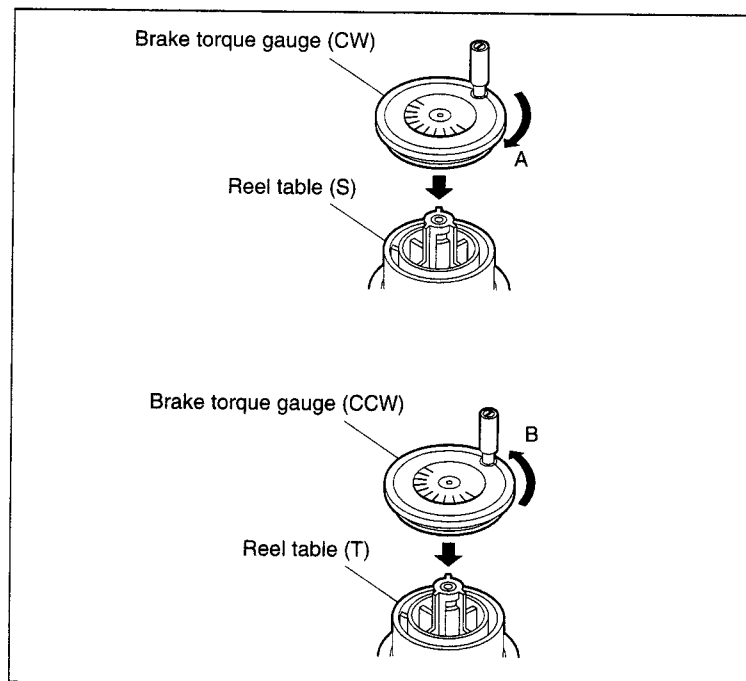
7. Reattaching the reel cover

(1) Align the reference hole in the reel cover with the pin in the reel motor, and hook the two claws.

(2) Fix the reel cover S or T with the screw. After fixing, apply screw locking compound. Tightening Torque : 0.1 N·m {1 kgf·cm}

8. Reattaching the MIC assembly (only when replacing the T-side brake assembly)

Reattach the MIC assembly.
(Refer to Section 7-19.)
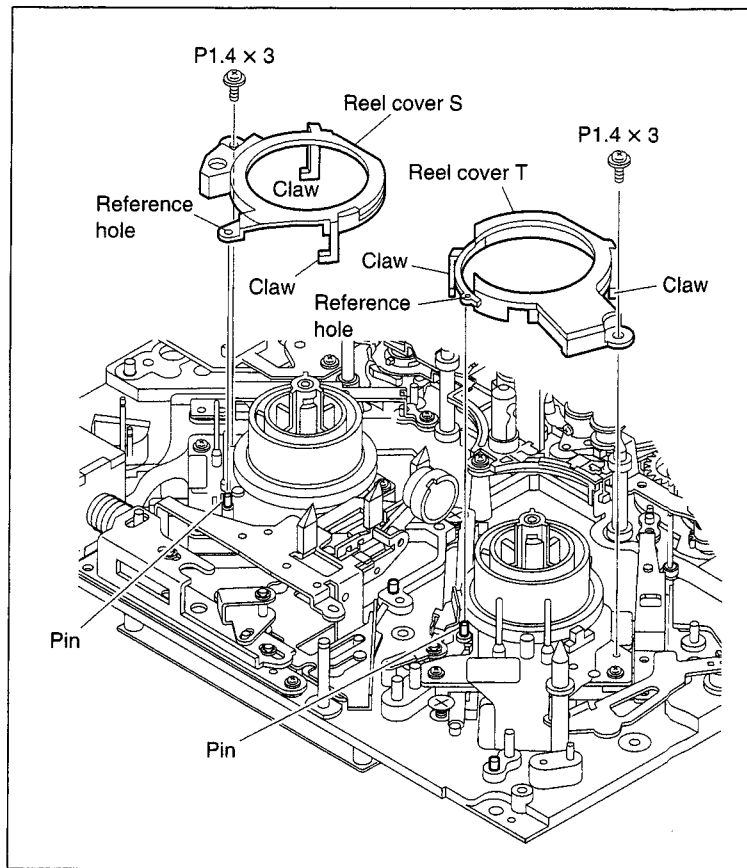
9. Reattaching the L push plate (only when replacing the T-side brake assembly)

Reattach the L-push plate with the two screws with the two holes in the L push plate aligned with the two protrusions on the RLR assembly.
Tightening Torque : 0.1 N·m {1 kgf·cm}
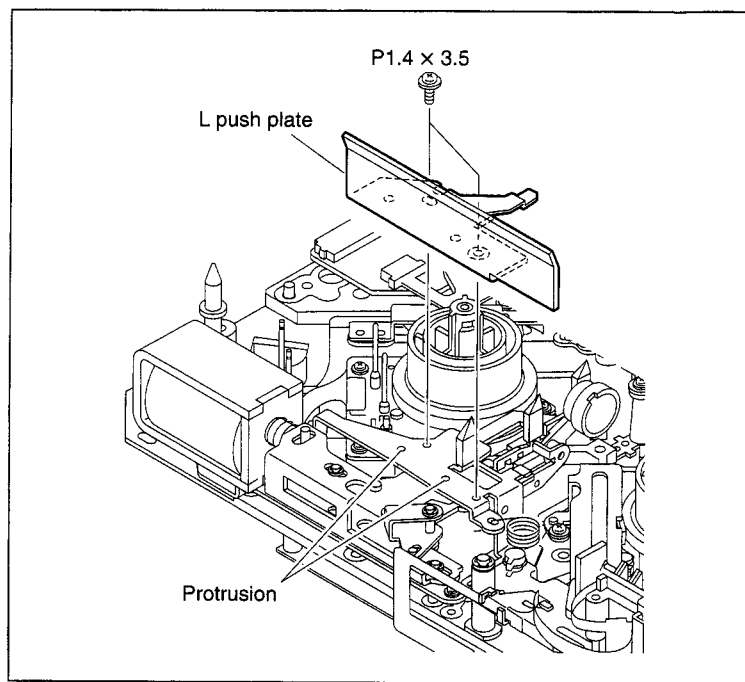
7-4. Brake Solenoid Replacement

Outline

Replacement
Disconnecting the connector
Removing the brake assembly
Replacing the brake solenoid
Reattaching the brake assembly
Reconnecting the connector
Checking the performance

Note

Prepare a new stop washer when replacing the brake solenoid.
Stop washer (1.5) : 3-669-465-01 × 1

Preparation

1. After setting the unit to the L cassette position, set it to the unthreading end status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)
4. Remove the cassette compartment. (Refer to Section 3-4.)

Tools

- Torque screwdriver's bit (for M1.4) :   J-6325-110-A
- Torque screwdriver's bit (for M2) :   J-6325-380-A
- Torque screwdriver (for 3 kgf·cm) :   J-6325-400-A
- Washer extracting fixture (A) :   J-6082-234-A
- Washer mounting fixture Ø1.5 :   J-6082-231-A
- Tweezers

Replacement

1. Disconnecting the connector

Disconnect the harness from the connector (CN15) on the DR-428 board located on the back side of the MD chassis with tweezers.

| Note |

Be careful not to suffer injury at hand by chassis during the disconnection.

2. Removing the brake assembly

(1) Remove the three screws fixing the brake assembly, and remove the brake assembly while slightly moving the iron core of the solenoid plunger in the direction toward pickup.

(2) Pull out the harness of the solenoid from the square hole in the left side of the chassis with the brake assembly lifted up.

P1.4 × 3.5

P1.4 × 3.5

Iron core

Brake assembly

P1.4 × 3.5

Harness

Chassis

Hole

CN15
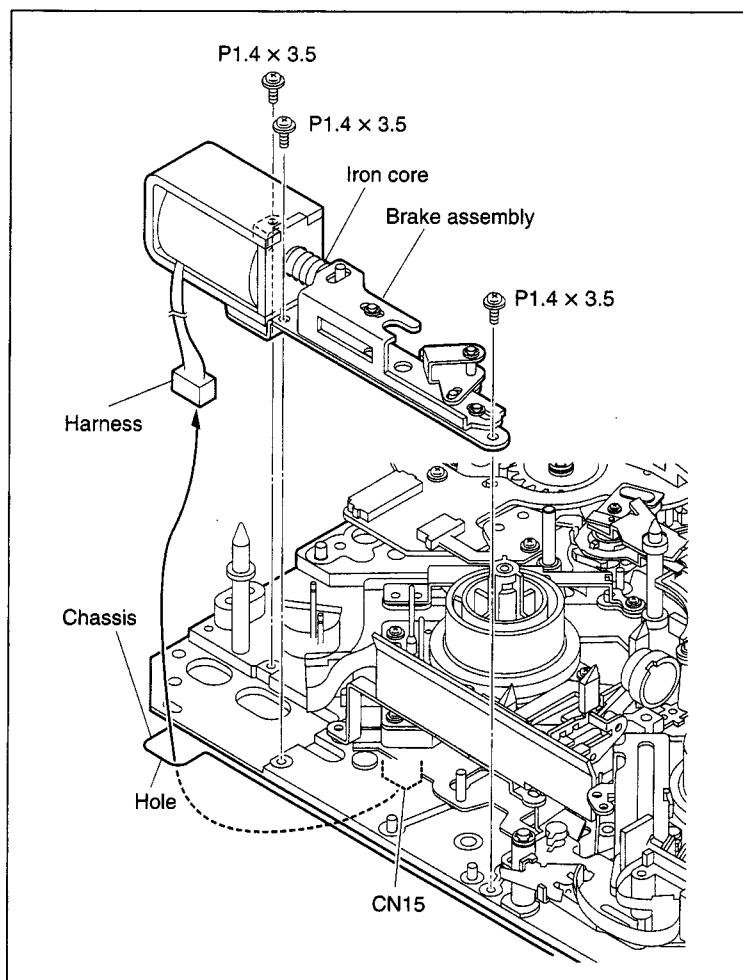
3. Replacing the brake solenoid

(1) Remove the two screws and remove the solenoid from the brake base assembly.

| Note |

During this operation, the two washers come off together with the two screws, and further the compressed coil spring comes off from the iron core of the solenoid. Be careful not to lose them.
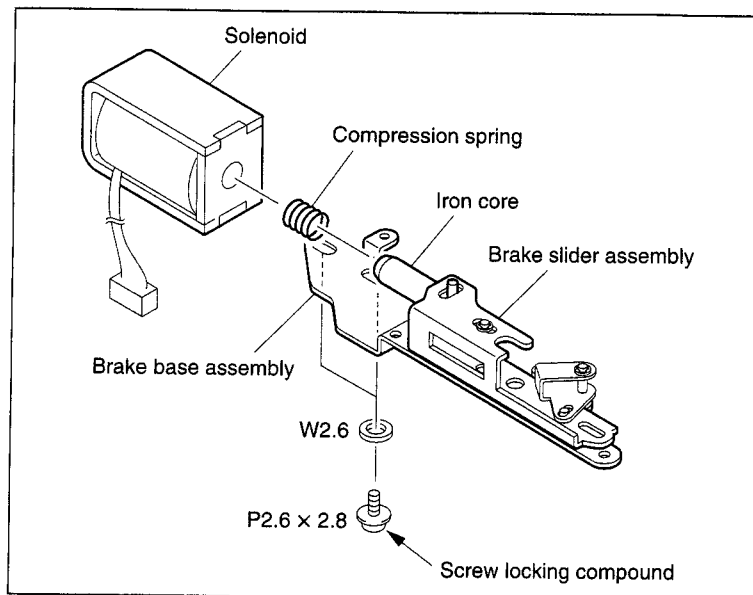
(2) Remove the stop washer shown in the brake slider assembly figure.

(3) Widen slightly the clearance shown in the brake slider assembly figure by a finger to remove the iron core of the solenoid.

| Note |

Applying an excessive force may cause deformation of the brake slider assembly.
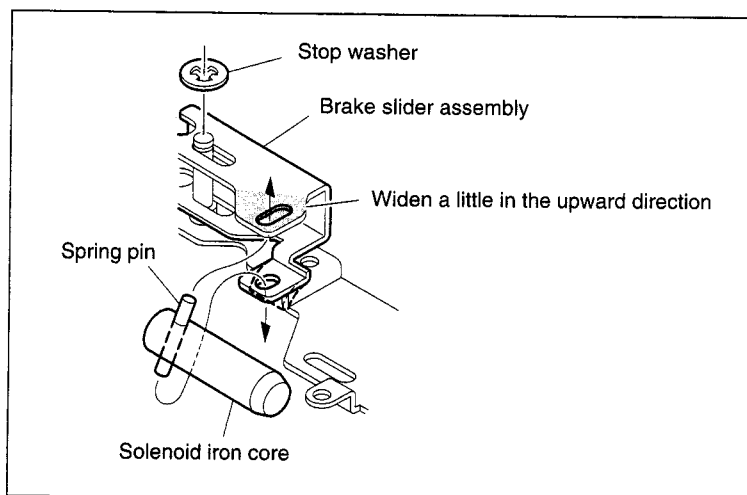
(4) Reattach an iron core pin of a new solenoid to the brake slider assembly following the same step (3).

(5) After fitting the compressed coil spring removed in step (1) on the iron core, insert the iron core in a new solenoid.

(6) Fix temporally the solenoid positioning as shown in the figure to the brake base assembly with the two screws and two washers.

(7) Ensure that the compressed coil spring is placed between the upper and lower plates of the brake slider assembly (within the double headed arrow) as shown in the figure.

(8) Adjust the solenoid position to satisfy the specification of the clearance between the pin of the solenoid iron core and the slotted hole in the brake base assembly under the condition that the iron core is fully pulled in, and tighten securely the two screws. Then apply screw locking compound.
Tightening Torque : 0.5 N•m {5 kgf•cm}

(9) Reattach the brake slider assembly to the brake base assembly with a new stop washer.
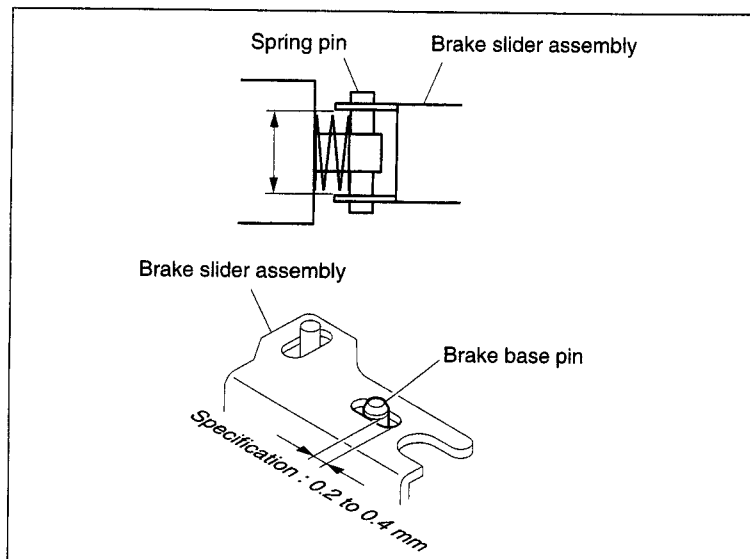
4. Reattaching the brake assembly

(1) Insert the harness of the brake assembly in a square hole on the left side of the chassis to bring it to the back side of the unit.

(2) Fit the slotted hole shown in the brake assembly figure on the pin on the brake release plate and further more fit the hole and slotted hole in the brake base assembly on the two reference pins of the MD chassis respectively, and fix it with the three screws.
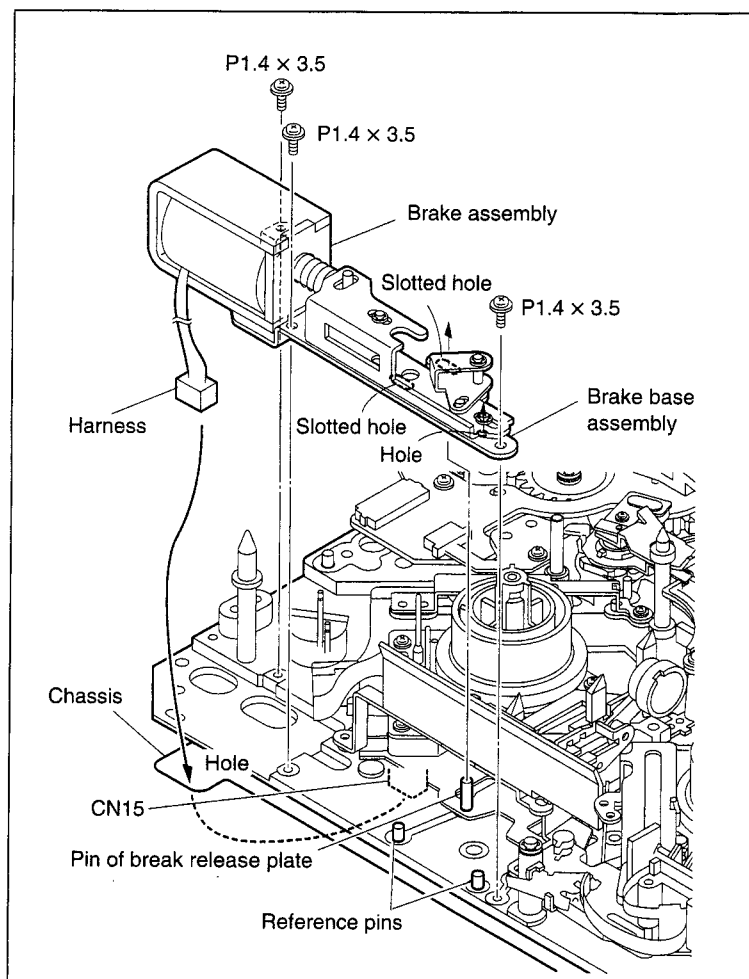Tightening Torque : 0.1 N•m {1 kgf•cm}

5. Reconnecting the connector

(1) Draw out the harness of the brake solenoid to bring it to the back side of the unit with tweezers.

(2) Reconnect the harness to the connector (CN15) on the DR-428 board.

6. Checking the performance

(1) Power on the unit and press the ◀ , MENU keys simultaneously to activate the maintenance menu.

(2) Following the pop-up menu in the maintenance menu, enter SERVO CHECK, PLUNGER CHECK, REEL BRAKE in order and select REEL BRAKE.

(3) Check that the brake solenoid ON/OFF switches smoothly by presing the ▲ , ▼ keys.

P1.4 × 3.5
P1.4 × 3.5
Brake assembly
Slotted hole
P1.4 × 3.5
Brake base assembly
Harness
Slotted hole
Hole
Chassis
Hole
CN15
Pin of break release plate
Reference pins

7-5. Pinch Roller Replacement

Outline

Replacement
Removing the pinch limiter assembly.
Reattaching the pinch limiter assembly.

Adjustment after replacement
Checking the tape path adjustment

Note

- The pinch roller is a part of the pinch limiter assembly, therefore replace the pinch limiter assembly itself when the pinch roller needs to be replaced.
- Prepare a new stop washer when replacing the pinch roller assembly.
  Stop washer (1.5) : 3-669-465-01

Preparation

1. Set the unit to the unthreading end status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)
4. Remove the cassette compartment. (Refer to Section 3-4.)

Tools

- Washer extracting fixture (A) :   J-6082-234-A
- Washer mounting fixture Ø1.5 :   J-6082-231-A
- Cleaning cloth :   3-184-527-01
- Cleaning fluid :   9-919-573-01
- Grease (SG-941) :   7-662-001-39
- Tweezers

Replacement

1. Removing the pinch limiter assembly

Remove the stop washer and remove the pinch limiter assembly.

| Note |

During this operation, if the compressed coil spring comes off together with the assembly, return the spring in place.

2. Reattaching the pinch limiter assembly

(1) Wipe a pinch roller in a new pinch limiter assembly with a cleaning cloth moistened with cleaning fluid.

(2) Wipe the shaft on the MD chassis with a cleaning cloth moistened with cleaning fluid.

(3) Apply grease about the quarter size of a tip of a cotton swab, to two portions of the shaft marked in the figure.

(4) Fit the hole in the pinch limiter assembly on the shaft on the MD chassis, while fitting the slotted hole in the pinch limiter assembly on the shaft on the pinch solenoid assembly, and fix it with a new stop washer (1.5).
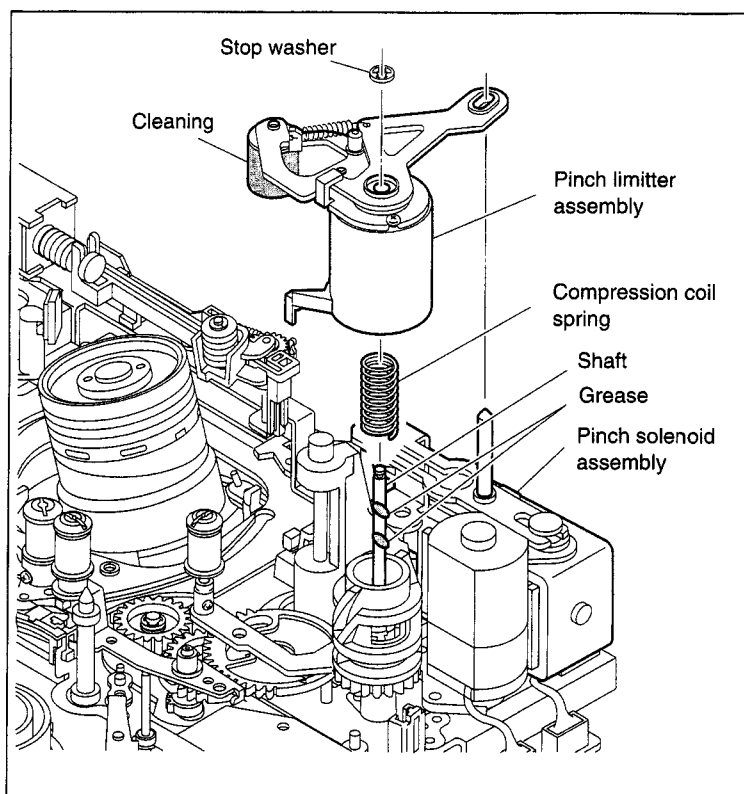
Adjustment after Replacement

3. Checking the tape path adjustment

(Refer to Section 8-4.)

Stop washer

Cleaning

Pinch limitter assembly

Compression coil spring

Shaft

Grease

Pinch solenoid assembly

7-6. Elevator Cam Replacement

Outline

Replacement
Removing the pinch limiter assembly
Replacing the elevator cam
Reattaching the pinch limiter assembly

Adjustment after replacement
Chacking the tape path adjustment

Note

Prepare two kinds of new stop washers when replacing the elevator cam.
Stop washer (1.5) : 3-669-465-01 × 1 (for mounting the pinch limiter assembly)
Stop washer (2.3) : 3-669-596-01 × 1 (for mounting the elevator cam)

Preparation

1. Set the unit to the unthreading end status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)
4. Remove the cassette compartment. (Refer to Section 3-4.)

Tools

- Washer extracting fixture (A) :   J-6082-234-A
- Washer mounting fixture Ø1.5 :   J-6082-231-A
- Cleaning cloth :   3-184-527-01
- Cleaning fluid :   9-919-573-01
- Grease (SGL-941) :   7-662-001-39
- Tweezers

Replacement

1. Removing the pinch limiter assembly
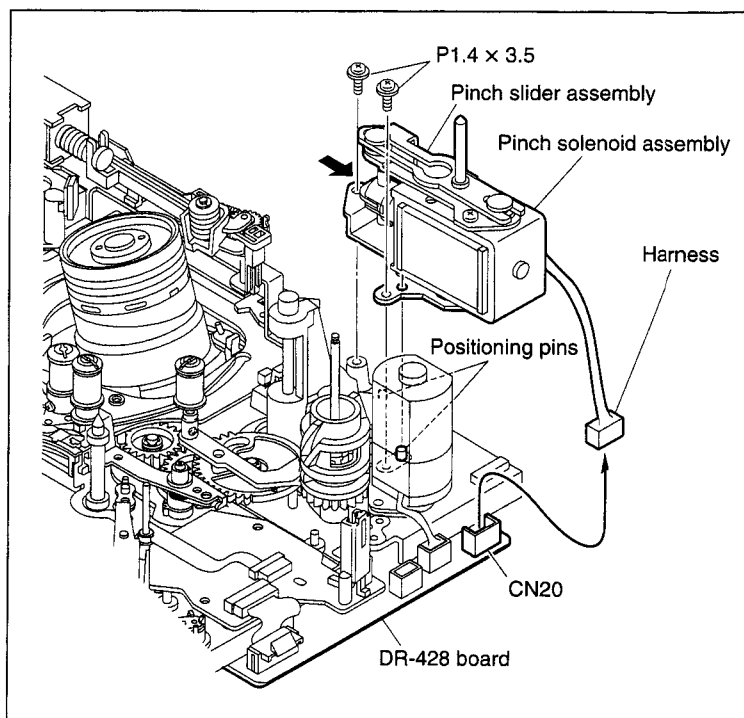Remove the pinch limiter assembly.
(Refer to Section 7-5.)

2. Replacing the elevator cam
(1) Lift off the compressed coil spring from the shaft on the MD chassis.
(2) Remove the stop washer and remove the elevator cam.
(3) Wipe the shaft on the MD chassis with a cleaning cloth moistened with cleaning fluid.
(4) Fit the elevator cam on the shaft on the chassis with the intermittent portion of the elevator cam joined to the intermittent portion of the No.7 gear as shown in the figure.
(5) Apply grease about the quarter size of a tip of a cotton swab, to two portions of the shaft shown in the figure.
(6) Reattach the elevator cam with a new stop washer (2.3).
(7) Fit the compressed coil spring on the shaft.

3. Reattaching the pinch limiter assembly
Reattach the pinch limiter assembly.
(Refer to Section 7-5.)

Adjustment after Replacement

4. Checking the tape path adjustment.
(Refer to Section 8-4.)
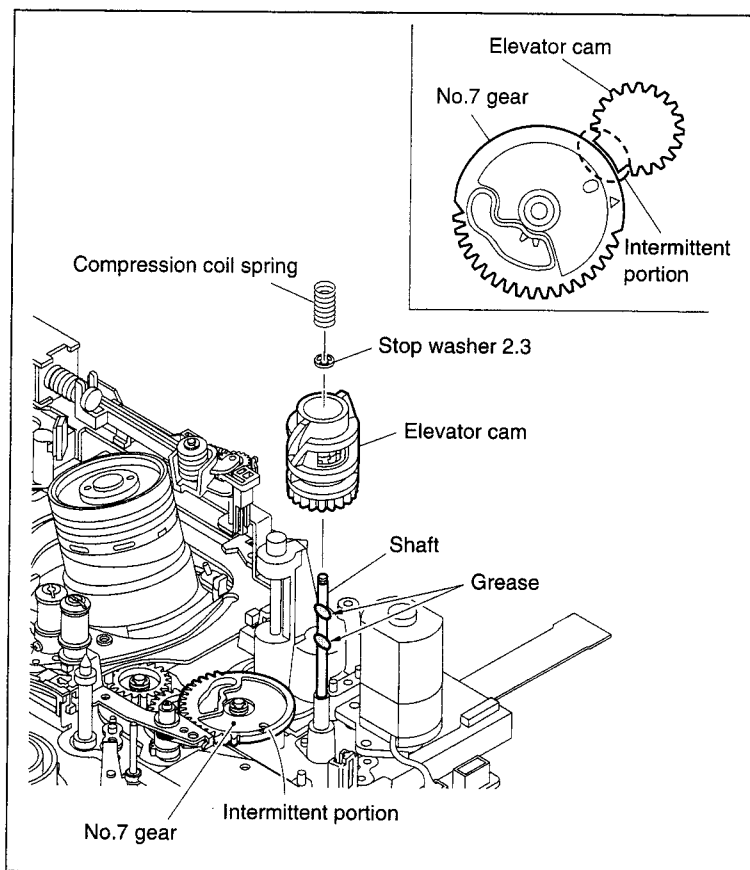
7-7. Pinch Solenoid Assembly Replacement

Outline

Replacement
Removing the pinch limiter assembly.
Disconnecting the connector.
Replacing the pinch solenoid assembly.
Reconnecting the connector.
Reattaching the pinch limiter assembly.

Adjustment after replacement
Checking the tape path adjustment

Note

Without removal/reattachment of the pinch limiter assembly, the pinch solenoid assembly cannot be replaced.
Therefore prepare a new stop washer for replacing the pinch limiter assembly.
Stop washer (1.5) : 3-669-465-01 × 1

Preparation

1. Set the unit to the unthreading end status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)
4. Remove the cassette compartment. (Refer to Section 3-4.)

Tools

- Torque screwdriver's bit (for M1.4) :   J-6325-110-A
- Torque screwdriver (for 3 kgf·cm) :   J-6325-400-A
- Washer extracting fixture (A) :   J-6082-234-A
- Washer mounting fixture Ø1.5 :   J-6082-231-A
- Tweezers

Replacement

1. Removing the pinch limiter assembly

Remove the pinch limiter assembly.
(Refer to Section 7-5.)

2. Disconnecting the connectors

Disconnect the harness from the connector
(CN20) on the DR-428 board with tweezers.

3. Replacing the pinch solenoid assembly

(1) Remove the two screws with the pinch slider
assembly drawn into the arrow direction and
lift off the pinch solenoid assembly.
(2) Align two holes in a new pinch solenoid
assembly with the two positioning pins on the
MD chassis respectively.
(3) Reattach the pinch solenoid utilizing the two
screws with the pinch slider assembly drawn
in the arrow direction.
Tightening Torque : 0.1 N•m { 1 kgf•cm}

4. Reconnecting the connector

Reconnect the harness to the connector (CN20)
on the DR-428 board with tweezers.

5. Reattaching the pinch limiter assembly

Reattach the pinch limiter assembly.
(Refer to Section 7-5.)

Adjustment after Replacement

6. Checking the tape path adjustment

(Refer to Section 8-4.)

7-8. Reel Motor (T) Assembly Replacement

Outline

Replacement
Disconnecting the connector
Moving the S/T reel tables
Removing the L push plate
Removing the MIC assembly
Removing the RMP (T1) retainer assembly
Replacing the reel motor (T) assembly
Reattaching the RMP (T1) retainer assembly
Reattaching the MIC assembly
Reattaching the L push plate
Reconnecting the connector
Checking the performance

Adjustment after replacement
T-REEL ONLY adjustment
TENSION adjustment
Tape path adjustment

Note

Without removal/reattachment of the MIC assembly, the reel motor (T) assembly
cannot be replaced. Prepare a new stop washer when reattaching the MIC assembly.
Stop washer (1.5) : 3-669-465-01 × 1
Use care not to lose the polyethylene washer between the base plate and the MIC
assembly.

Preparation

1. After setting the standard cassette position, set the unit to the unthreading end
   status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)
4. Remove the cassette compartment. (Refer to Section 3-4.)

Tools

- Torque screwdriver's bit (for M1.4) :   J-6325-110-A
- Torque screwdriver's bit (for M2) :   J-6325-380-A
- Torque screwdriver (for 3 kgf•cm) :   J-6325-400-A
- Washer extracting fixture (A) :   J-6082-234-A
- Washer mounting fixture Ø1.5 :   J-6082-231-A
- Cleaning cloth :   3-184-527-01
- Cleaning fluid :   9-919-573-01

Replacement

1. Disconnecting the connector

Disconnect the flexible card wire from the connector (CN17) on the DR-428 board located on the back side of the MD chassis.

2. Moving the S/T reel tables

Turn the reel shift motor gear by a skewer and bring the S/T reel tables to the standard cassette position. (Refer to Section 7-19.)

3. Removing the L push plate

Remove the L push plate. (Refer to Section 7-3.)

4. Removing the MIC assembly

Remove the MIC assembly.
(Refer to Section 7-19.)

5. Removing the RMP (T1) retainer assembly

(1) Remove the screw (a) with the T-drawer arm assembly drawn lightly in the arrow direction.
(2) Remove the screw (b) and remove the RMP (T1) retainer assembly.
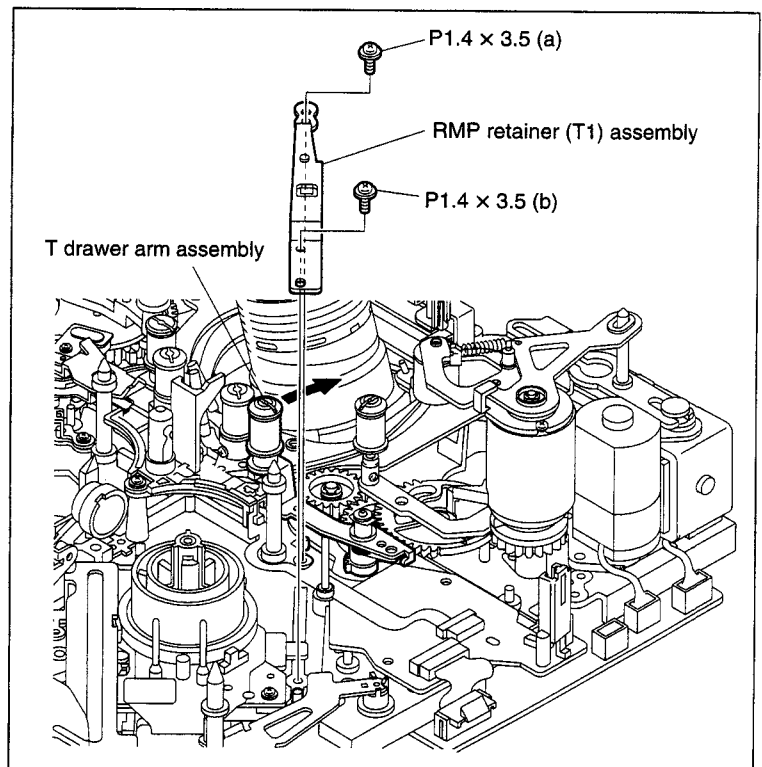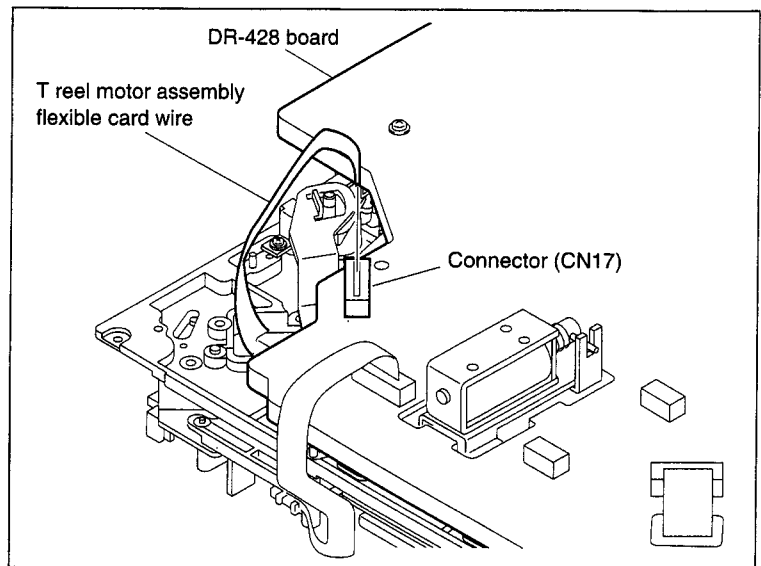
6. Replacing the reel motor (T) assembly

(1) Remove the two screws (ⓐ, ⓑ) securing the slide shaft and remove the reel motor (T) assembly.

(2) Extract the slide shaft from the reel motor (T) assembly.

(3) Wipe the shaded portion in the figure with a cleaning cloth moistened with cleaning fluid.

(4) Apply grease about the quarter size of a tip of a cotton swab, to the center of the shaded portion.

(5) Wipe the slide shaft with dry cloth such as gauze, and then insert it in a hole of a new reel motor T assembly.

| **Note** |

Use extreme care not to scratch the shaft and hole during extracting and inserting operation.

(6) Insert a shaft located on the back side of the reel motor (T) assembly in the slot in the RS plate assembly.

(7) Insert the flexible card wire in the square hole in the MD chassis.

(8) Tighten the screw ⓐ and next ⓑ to reattach the slide shaft.

Tightening Torque : 0.1 N·m {1 kgf·cm}

7-24
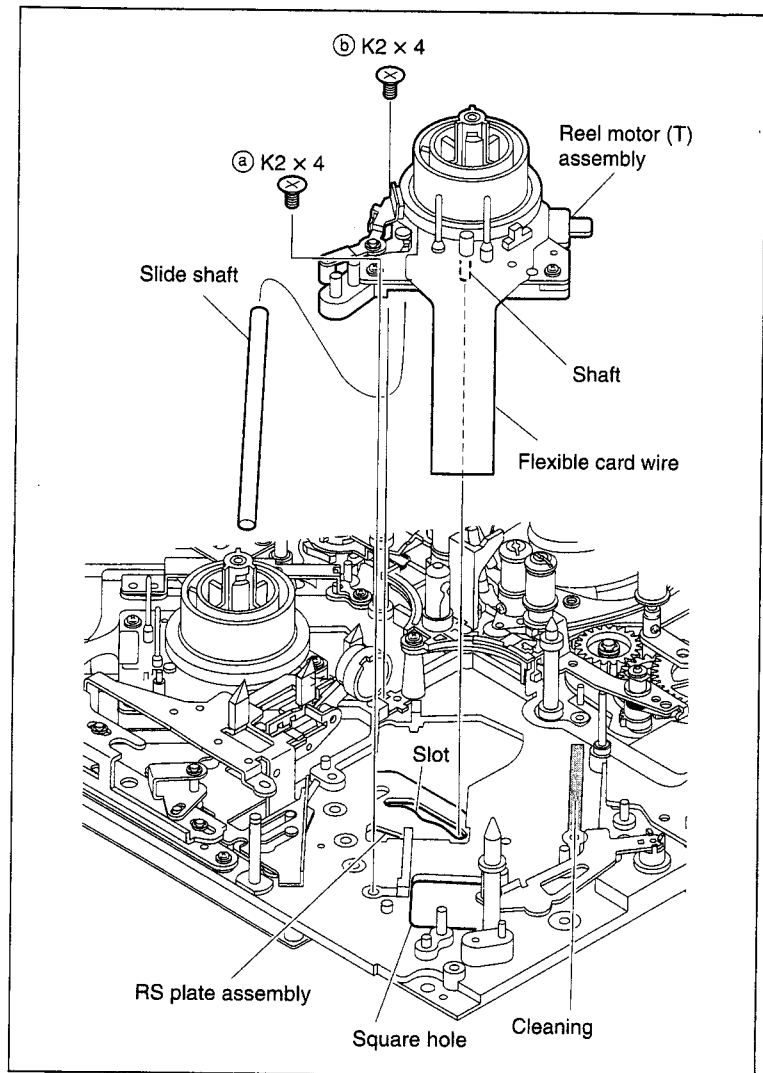
7. Reattaching the RMP (T1) retainer assembly

(1) Fit the two positioning holes in the RMP (T1) retainer assembly on the two positioning pins on the MD chassis.

(2) Tighten the two screws to fix the RMP (T1) retainer assembly while drawing lightly the T drawer arm assembly in the arrow direction.

8. Reattaching the MIC assembly

Reattach the MIC assembly.
(Refer to Section 7-19.)

9. Reattaching the L push plate

Reattach the L push plate. (Refer to Section 7-3.)
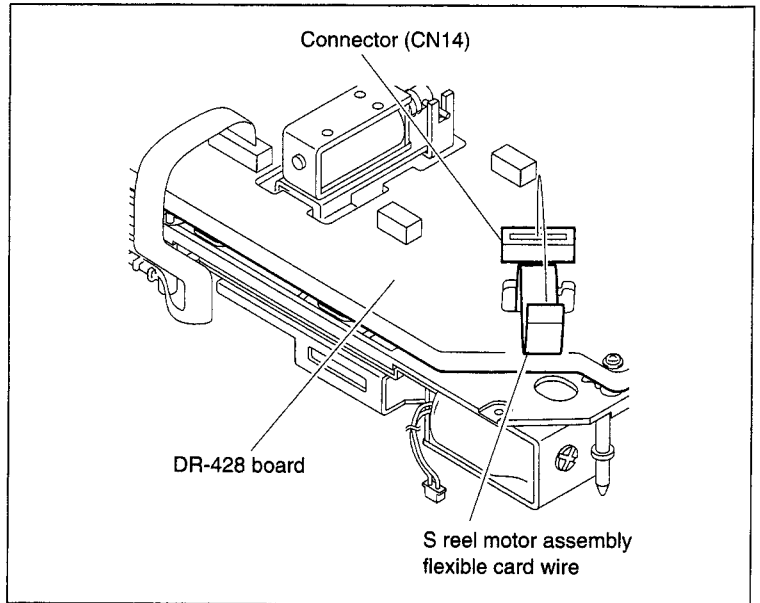
10. Reconnecting the connector

Reconnect the flexible card wire to the connector (CN17) on the DR-428 board located on the back side of the MD chassis.

Notes

- Be careful not to insert the flexible card wire obliquely.
- Do insert the flexible card wire straight and securely as far as it will go.
- Take care not to fold the flexible card wire. This shortens the life of the flexible card wire.

11. Checking the performance

Check the S/T reel tables move smoothly by turning the reel shift motor gear by a skewer.

Adjustment after Replacement

12. T-REEL ONLY adjustment

(Refer to Section 5-3-4.)

13. TENSION adjustment

(Refer to Section 5-3-4.)

14. Tape path adjustment

(Refer to Section 8-2.)
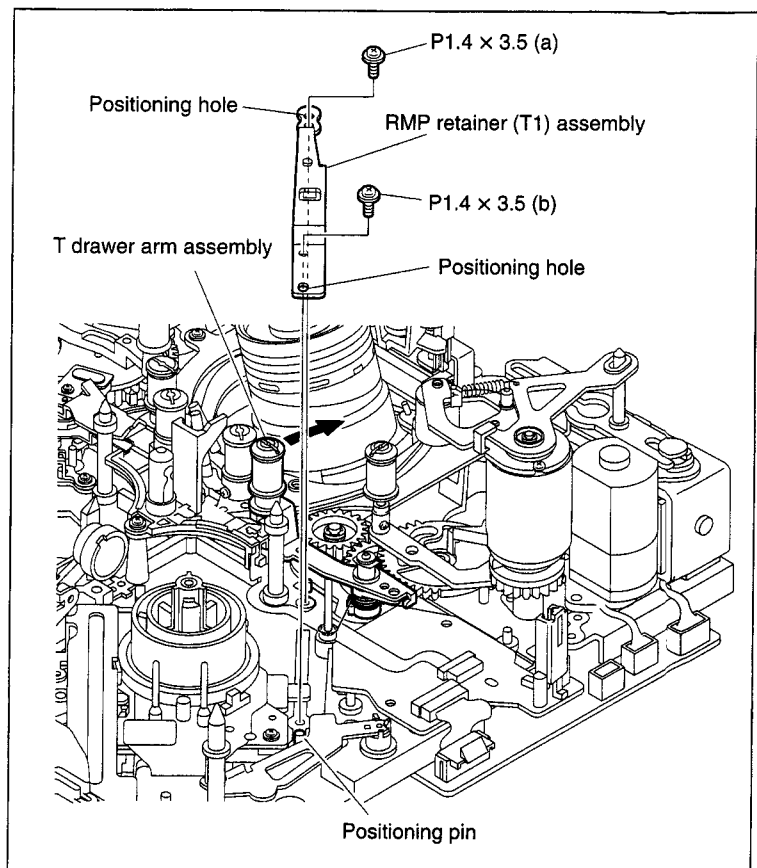
7-9. Reel Motor (S) Assembly Replacement

Outline

Replacement
Disconnecting the connector
Moving the S/T reel tables
Removing the RMP (S1) retainer assembly
Replacing the reel motor (S) assembly
Reattaching the RMP (S1) retainer assembly
Reconnecting the connector
Checking the performance

Adjustment after replacement
S-RELL ONLY adjustment
TENSION adjustment
Tape path adjustment

Preparation

1. After setting the unit to the standard cassette position, set it to the unthreading end status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)
4. Remove the cassette compartment. (Refer to Section 3-4.)

Tools

- Torque screwdriver's bit (for M1.4) :   J-6325-110-A
- Torque screwdriver's bit (for M2) :   J-6325-380-A
- Torque screwdriver (for 3 kgf•cm) :   J-6325-400-A
- Cleaning cloth :   3-184-527-01
- Cleaning fluid :   9-919-573-01

Replacement

1. Disconnecting the connector

Disconnect the flexible card wire from the connector (CN14) on the DR-428 board located on the back side of the MD chassis.

2. Moving the S/T reel tables

Turn the reel shift motor gear by a skewer and bring the S/T reel tables to the standard cassette position. (Refer to Section 7-19.)

Connector (CN14)

DR-428 board

S reel motor assembly
flexible card wire

3. Removing the RMP (S1) retainer assembly

(1) Remove the screw (a) with the S tension regulator arm assembly drawn lightly in the arrow direction.

(2) Remove the screw (b), then remove the RMP (S1) retainer assembly.

S tension regulator arm assembly

Screw (a)

P1.4 × 3.5 (a)

P1.4 × 3.5 (b)

RMP retainer
(S1) assembly
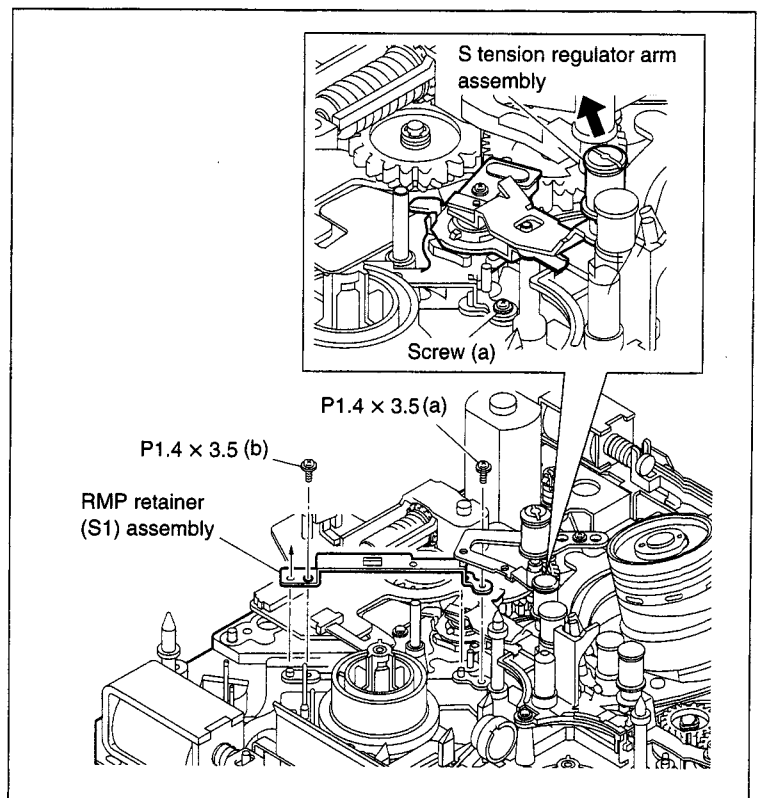
4. Replacing the reel motor (S) assembly

(1) Remove the two screws (ⓐ, ⓑ) securing the slide shaft and remove the reel motor (S) assembly.

(2) Extract the slide shaft from the reel motor (S) assembly.

(3) Wipe the shaded portion in the figure with a cleaning cloth moistened with cleaning fluid.

(4) Apply grease about the quarter size of a tip of a cotton swab, to the center of the shaded portion.

(5) Wipe the slide shaft with dry cloth such as gauze, and then insert it in a hole of a new reel motor S assembly.

| Note |

Use extreme care not to scratch the shaft and hole during extracting and inserting operation.

(6) Insert a shaft located on the back side of the reel motor (S) assembly in the slot in the RS plate assembly.

(7) Insert the flexible card wire in the square hole in the MD chassis.

(8) Tighten the screw ⓐ and next ⓑ to reattach the slide shaft.
Tightening Torque : 0.1 N•m {1 kgf•cm}
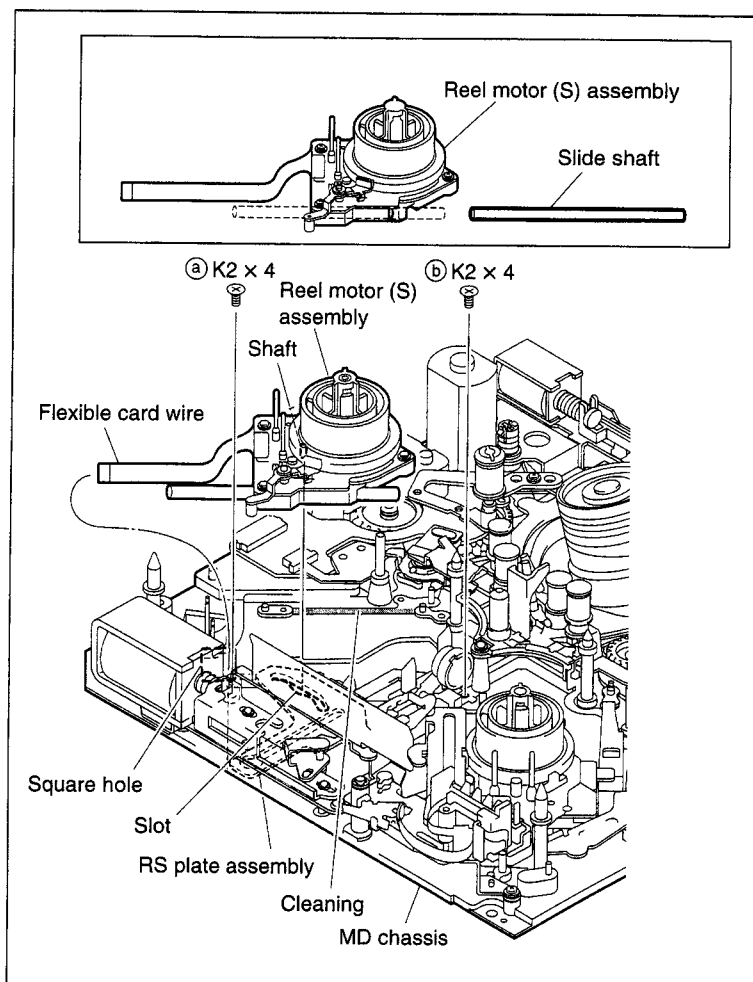
5. Reattaching the RMP (S1) retainer assembly

(1) Fit the two positioning holes in the RMP (S1) retainer assembly on the two positioning pins on the MD chassis.

(2) Tighten the two screws to fix the RMP (S1) retainer assembly while drawing lightly the S tension regulator arm assembly in the arrow direction.

6. Reconnecting the connector

Reconnect the flexible card wire to the connector (CN14) on the DR-428 board located on the back side of the MD chassis.

| Notes |

• Be careful not to insert the flexible card wire obliquely.

• Do insert the flexible card wire straight and securely as far as it will go.

• Take care not to fold the flexible card wire. This shortens the life of the flexible card wire.

7. Checking the performance

Check the S/T reel tables move smoothly by turning the reel shift motor gear by a skewer.

Adjustment after Replacement

8. S-REEL ONLY alignment

(Refer to Section 5-3-4.)

9. TENSION alignment

(Refer to Section 5-3-4.)

10. Tape path adjustment

(Refer to Section 8-2.)
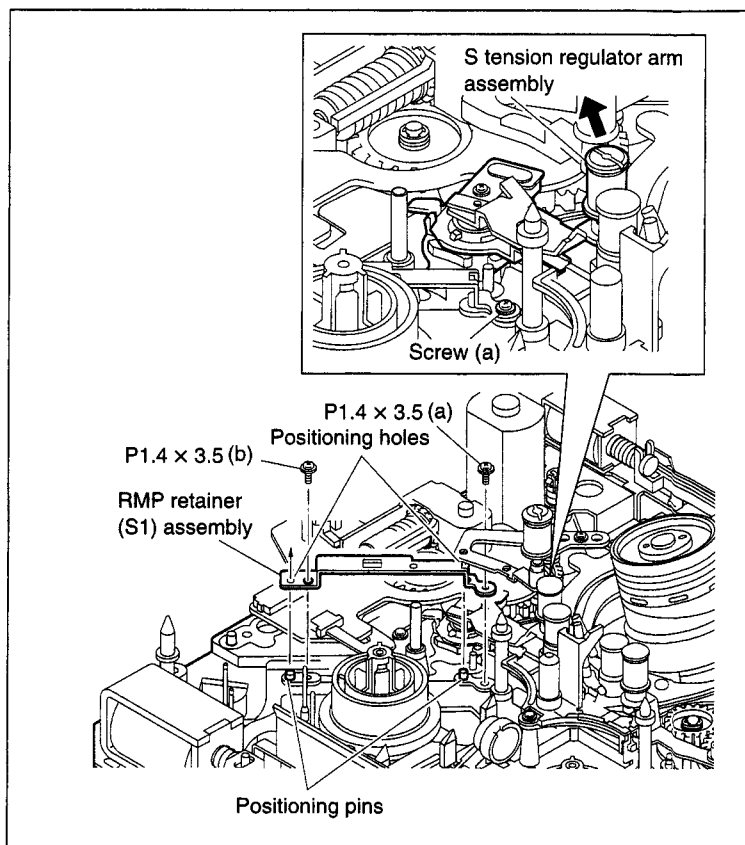
7-10. M Stop Solenoid Assembly Replacement

Outline

Replacement
Removing the stopper driving plate (M) assembly
Replacing the M stop solenoid assembly
Reattaching the stopper driving plate (M) assembly

Preparation

1. Set the unit to the unthreading end status.
2. Power off the unit.

Tools

- Torque screwdriver's bit (for M1.4) :   J-6325-110-A
- Torque screwdriver's bit (for M2) :   J-6325-380-A
- Torque screwdriver (for 3 kgf•cm) :   J-6325-400-A
- Screw locking compound :   7-432-114-11

Replacement

1. Removing the stopper driving plate (M) assembly

(1) Disconnect the harness of the M stop solenoid assembly from the connector (CN13) on the DR-428 board.

(2) Remove the two screws and remove the stopper driving plate (M) assembly.

P1.4 × 3.5

P1.4 × 3.5

Stopper driving plate (M) assembly

Connector (CN13)
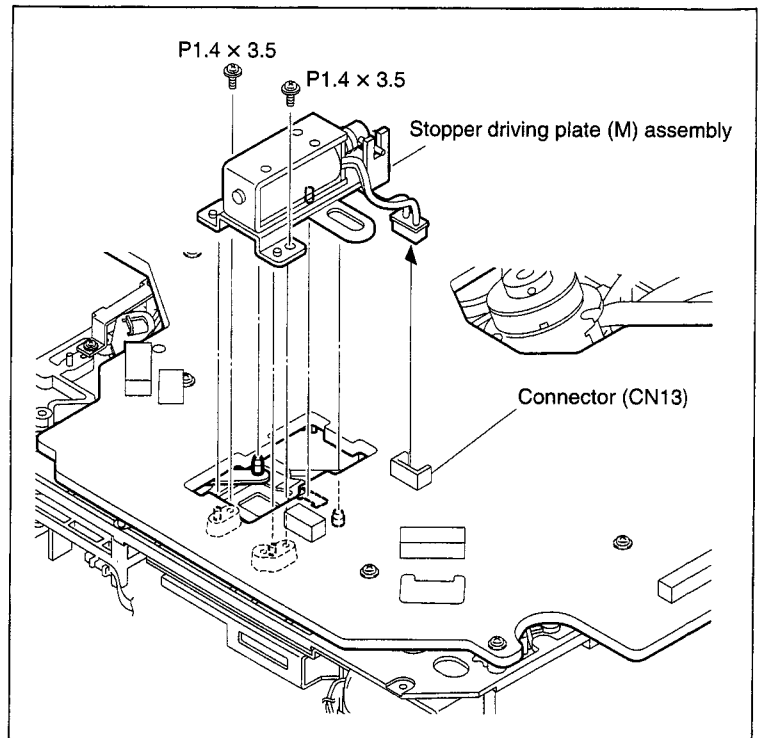
2. Replacing the M stop solenoid assembly

(1) Remove the two screws to remove the stopper driving plate (M) assembly.

(2) Remove the two screws to remove the plunger solenoid from the stroke limiter plate.

(3) Extract the compressed coil spring from the iron core of the plunger solenoid removed in step (2) and fit the spring on a new solenoid iron core.

P2 × 2

Stopper driving plate

Plunger solenoid

Compression spring

Iron core
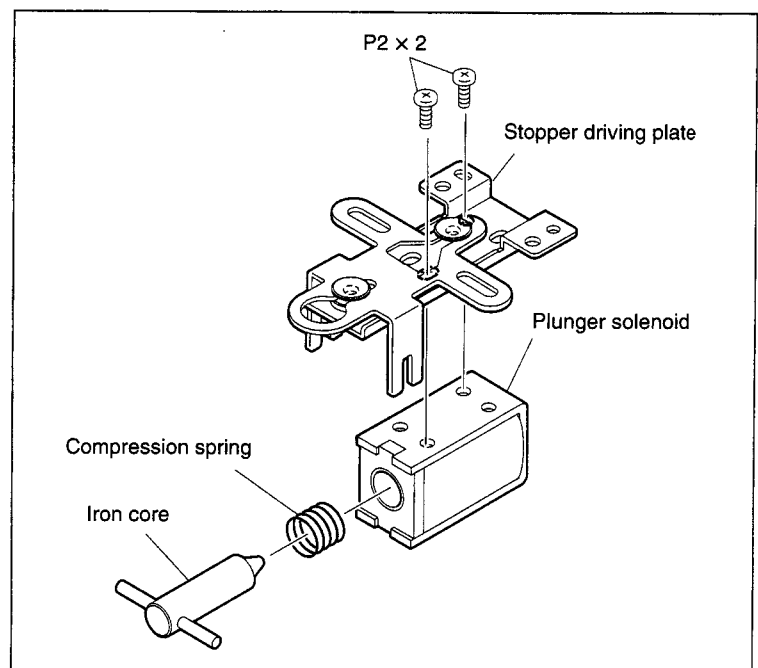
(4) Temporally fix the new plunger solenoid to the stroke limiter plate with the two screws.

(5) Adjust the clearance between the pin of the plunger solenoid and the stroke limiter plate as shown in the figure to meet the specification below, and tighten the two screws securely. After tightening, apply screw locking compound.
Tightening Torque : 0.2 N•m {2 kgf•cm}
Specification : 3 ± 0.1 mm

Specification : 3 ±0.1 mm
Pin
Plunger solenoid
Pin
Stroke limiter plate
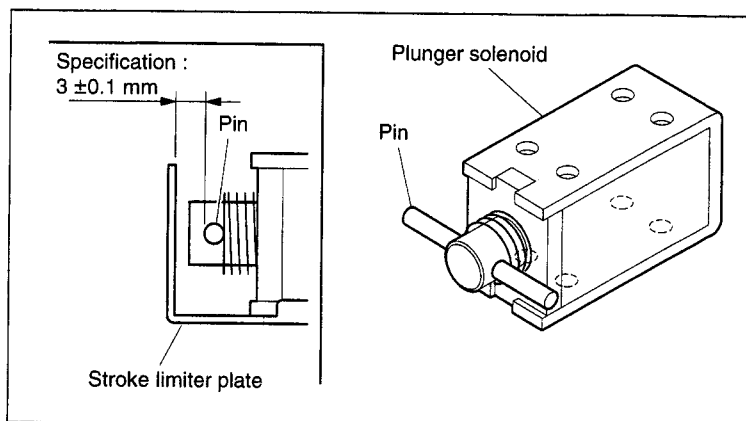
(6) Fit the two notches of the stopper driving plate on both ends of the iron-core pin, then reattach the stopper driving plate to the plunger solenoid by the two screws.
Tightening Torque : 0.2 N•m {2 kgf•cm}

(7) Ensure the stopper driving plate returns to the original position after being pressed in the arrow direction and released.

P2 x 2
Hole for screw
Hole for screw
Stopper driving plate
Plunger solenoid
Notch
Pins
Screw locking compound
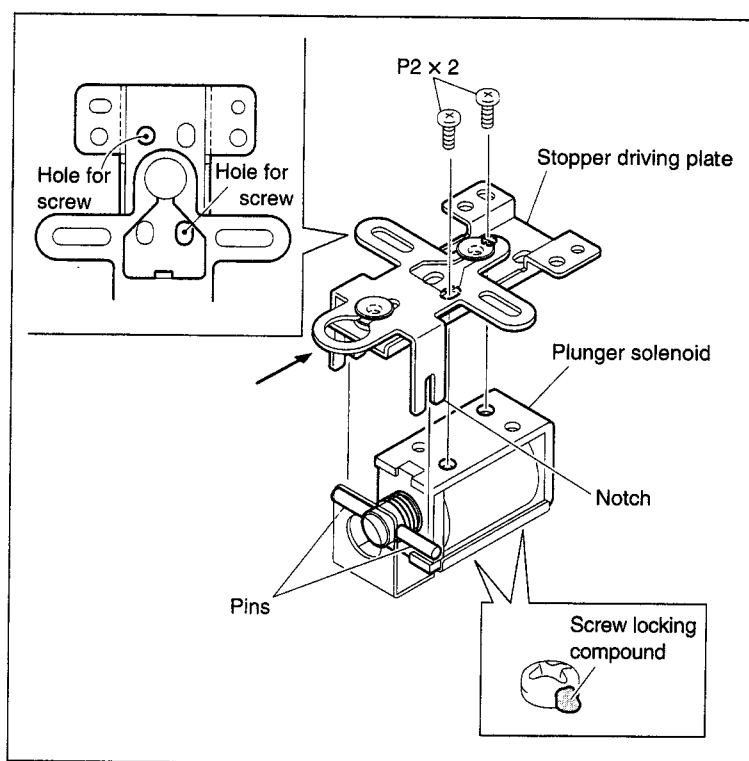
3. Reattaching the stopper driving plate (M) assembly

(1) Move the shaft b on the M stopper (T) assembly and the shaft c on the M stopper (S) assembly toward the drum by a finger.

(2) Insert the shaft located on the back side of the stopper driving plate (M) assembly in the slotted hole in the MIC drive (M) assembly. Fit the two slotted holes in the stopper driving plate (M) assembly shown in the figure on the shafts on M stopper (T) and (S) assemblies, and then fix it on the MD chassis with the two screws.
Tightening Torque : 0.1 N•m {1 kgf•cm}

(3) Ensure that the M stopper (T) and (S) assemblies and MIC drive (M) assembly move smoothly with the iron core of the solenoid drawn in the pulled-in direction.

(4) Reconnect the harness of the M stop solenoid to the connector (CN13) on the DR-428 board.
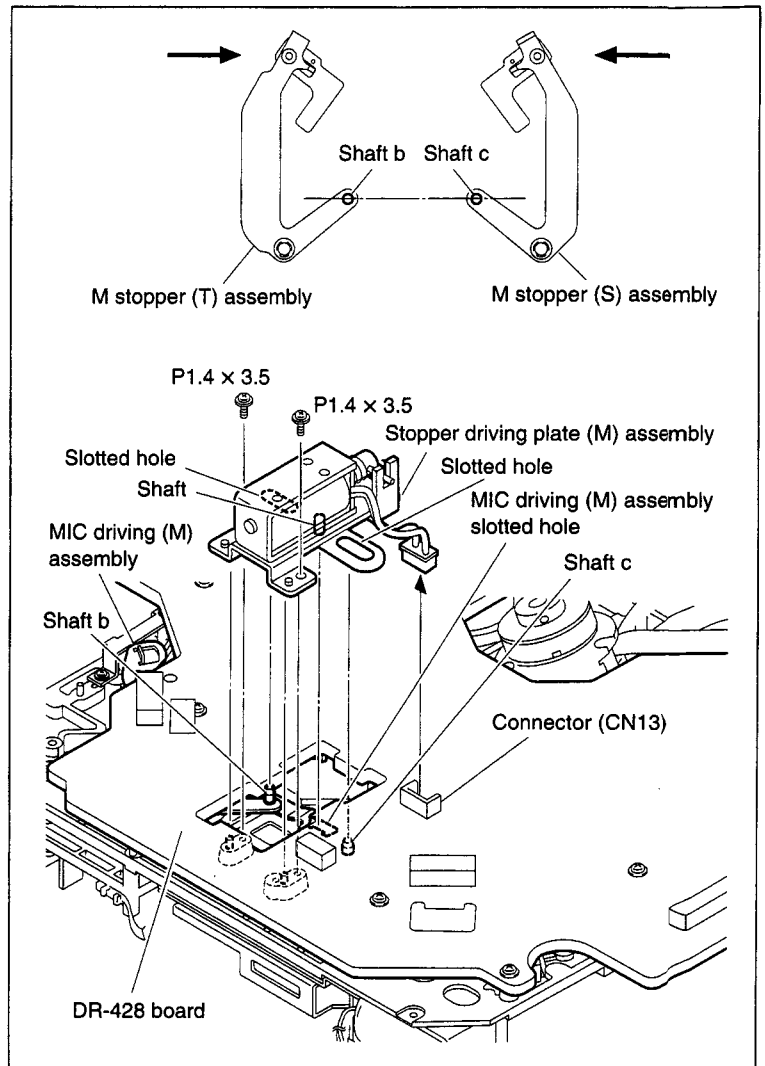
7-11. S Tension Regulator Assembly Replacement

Outline

Replacement
Removing the TG1 arm assembly
Removing the loading motor assembly
Removing the SE-521 board
Replacing the S tension regulator assembly
Reattaching the SE-521 board
Reattaching the loading motor assembly
Reattaching the TG1 arm assembly
Cleaning the tape guide

Adjustment after replacement
TENSION adjustment
Tape path adjustment

Notes

Use extreme care not to scratch the drum when replacing the S tension regulator assembly.
Never loosen the screw shown in the figure. If the screw is loosened, replace the S tension regulator with a new one.

Preparation

1. Set the unit to the unthreading end status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)
4. Remove the cassette compartment. (Refer to Section 3-4.)

Tools

* Torque driver's bit (for M1.4) : J-6325-110-A
* Torque driver (for 3 kgf·cm) : J-6325-400-A
* Cleaning cloth :   3-184-527-01
* Cleaning fluid :   9-919-573-01
* Tweezers
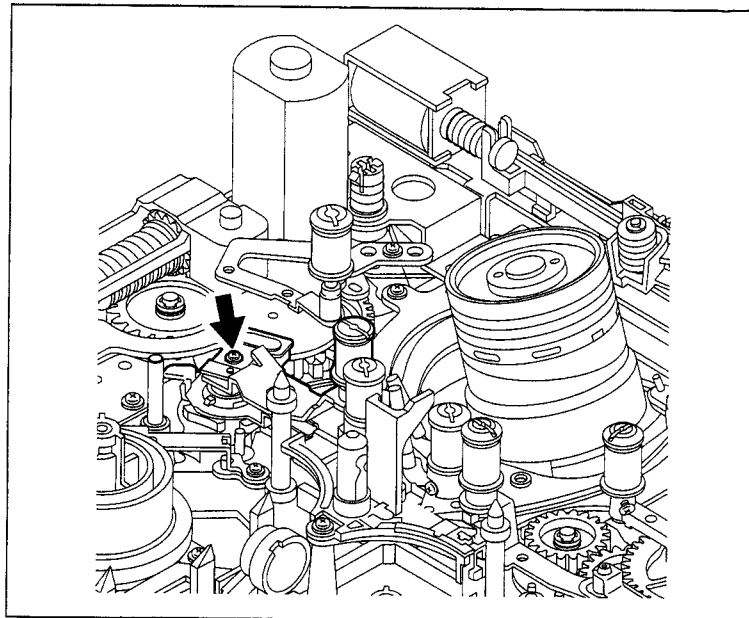
Replacement

1. Removing the TG1 arm assembly
Remove the TG1 arm assembly.
(Refer to Section 7-13.)

2. Removing the loading motor assembly
Remove the loading motor assembly.
(Refer to Section 7-17.)

3. Removing the SE-521 board
(1) Disconnect the flexible card wire from the connector (CN3) on the SE-521 board.
(2) Disconnect the flexible card wire from the connector (CN4) on the SE-521 board.
(3) Remove the screw and remove the SE-521 board.

> **Note**
> Use care about the claw of the worm holder.

P1.4 × 3.5
SE-521 board
Connector (CN4)
Connector (CN3)
Claw of warm holder
Flexible card wire
Flexible card wire
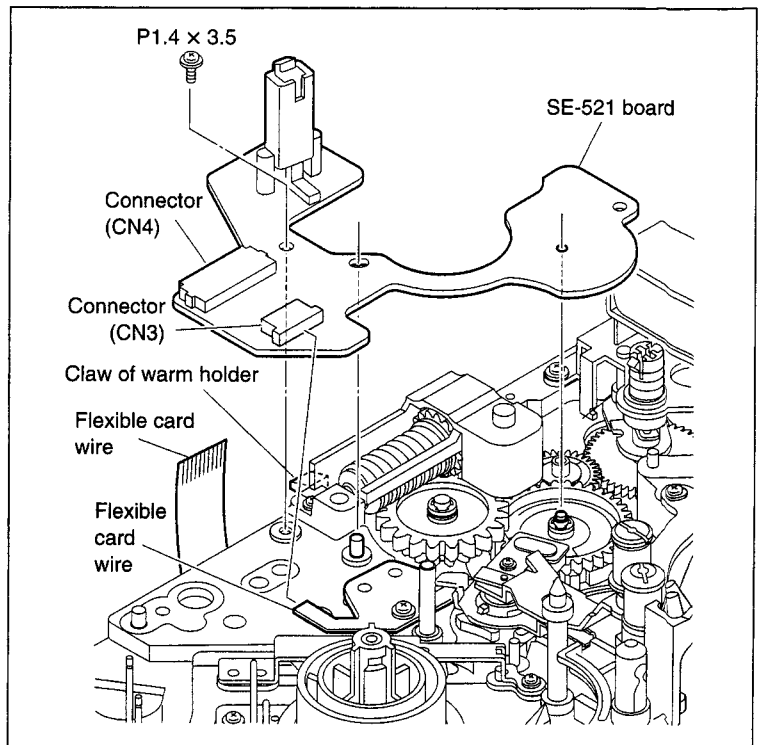
4. Replacing the S tension regulator assembly
(1) Remove the S tension regulator assembly by removing the two screws.
(2) Turn the manual eject cover clockwise until No.3 gear comes to the position shown in the figure.
(3) Engage a gear on a new S tension regulator assembly with No.3 gear as shown in the figure, and align the notch of the S tension regulator with the positioning pin on the chassis, then attach the new assembly to the chassis with the screw (a).
(4) Turn the manual eject cover counterclockwise to bring to the unthreading end position.
(5) Reattach the S tension regulator assembly to the MD chassis with the screw (b).
   Tightening Torque : 0.1 N•m {1 kgf•cm}
(6) Turn the manual eject cover clockwise to enter the threading condition. At this operation, check the two points below.
   The spring of the S tension regulator assembly shown in the figure do not contact the post of No.3 gear.
   The column pushes the spring under unthreading end status.
   Unless satisfy these conditions, perform the step (2) and after.
(7) Turn the manual eject cover counterclockwise to bring to the unthreading end position.

No.3 gear
Tension regulator assembly
(b) P1.4 × 3.5
(a) P1.4 × 3.5
Spring
Notch
S tension regulator assembly
Manual eject cover
Positioning pin   Post of No.3 gear
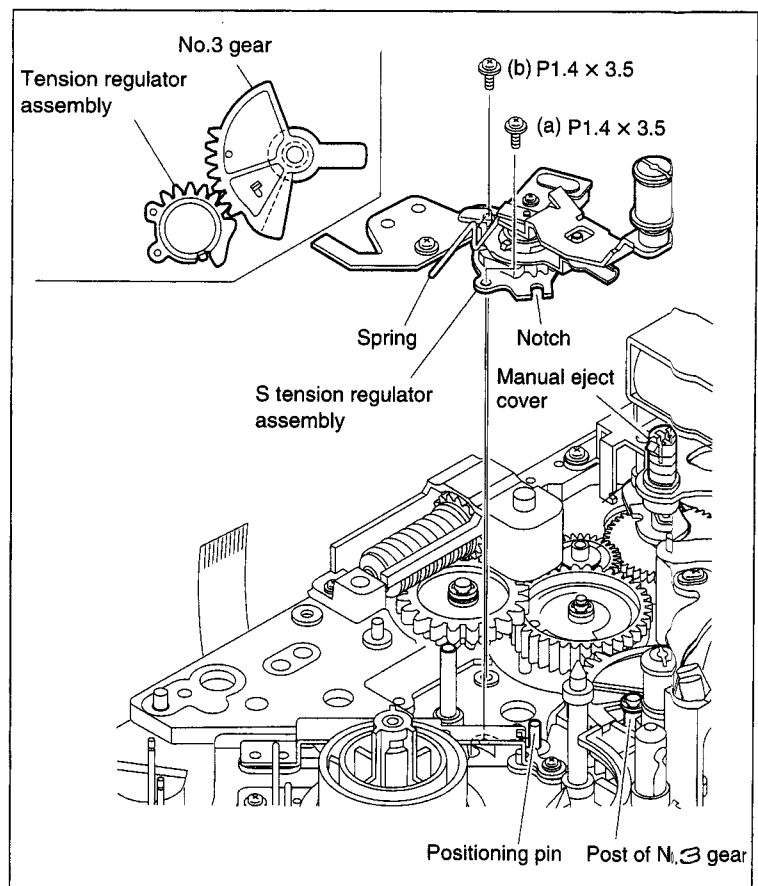
5. Reattaching the SE-521 board

(1) Fit the hole and slotted hole on the SE-521 board on the two shafts on the MD chassis respectively and fix it with the screw.

| Notes |

• At this operation, be careful not to pinch the tip of the flexible card wire of the S tension regulator assembly between the SE-521 board and the chassis.
• Insert the SE-521 board under the claw of the worm holder.

(2) Reconnect the flexible card wire to the connector (CN4) on the SE-521 board.

(3) Reconnect the flexible card wire of the S tension regulator assembly to the connector (CN3) on the SE-521 board.

6. Reattaching the loading motor assembly

Reattach the loading motor assembly.
(Refer to Section 7-17.)

7. Reattaching the TG1 arm assembly

Reattach the TG1 arm assembly.
(Refer to Section 7-13.)

8. Cleaning the tape guide

Wipe the tape guides of the S tension regulator and the TG1 arm assemblies with a cleaning cloth moistened with cleaning fluid.

Adjustment after Replacement

9. TENSION adjustment

(Refer to Section 5-3-4.)

10. Tape path adjustment

(Refer to Section 8-2.)

P1.4 × 3.5

SE-521 board

Connector (CN4)

Slotted hole

Connector (CN3)

Worm holder

Flexible card wire

A

Flexible card wire

View from the A point
Worm holder claw

SE-521 board

7-36
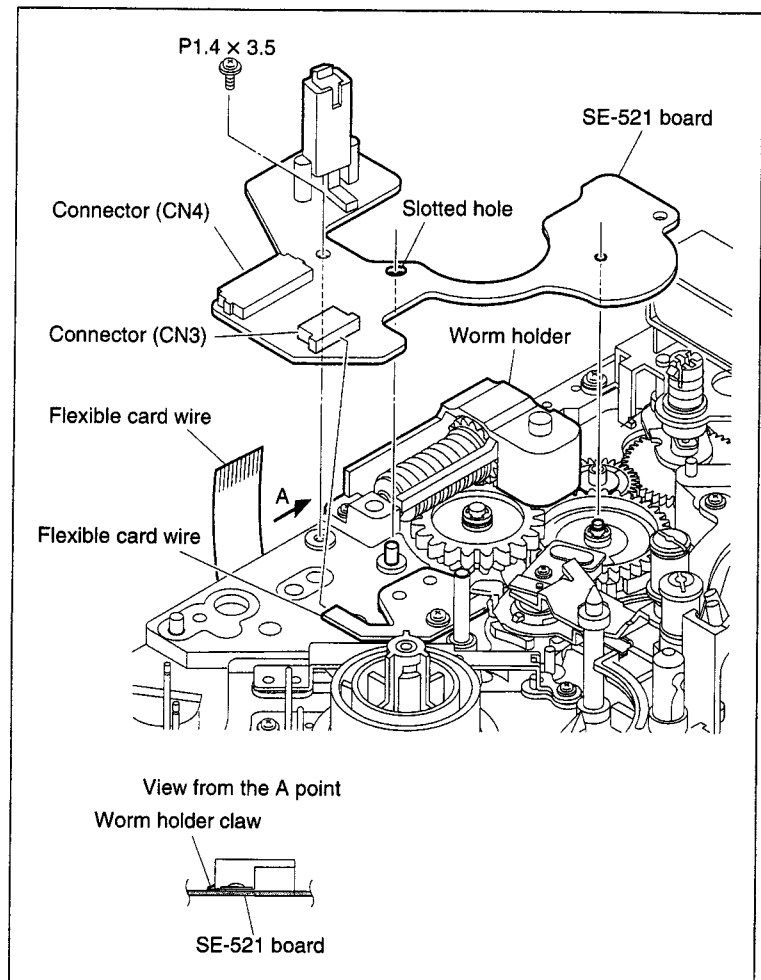
7-12. T Drawer Arm Assembly Replacement

Outline

Replacement

Removing the T drawer arm assembly
Checking the mounting position of the T gear
Reattaching the T drawer arm assembly
Cleaning the tape guide

Adjustment after replacement

Checking the tape path adjustment

Note

Use extreme care no to scratch the drum when replacing the T drawer arm assembly.

Preparation

1. Let the unit into the unthreading position.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)
4. Remove the cassette compartment. (Refer to Section 3-4.)

Tools

*   Cleaning cloth :   3-184-527-01
*   Cleaning fluid :   9-919-573-01
*   Tweezers

Replacement

1. Removing the T drawer arm assembly

(1) Remove the stop washer from the shaft on the MD chassis and remove the T drawer arm assembly.

(2) Remove the portion "a" of the T spring shown in the figure from the notch in the T drawer arm assembly with tweezers.

(3) Remove the T drawer arm assembly.
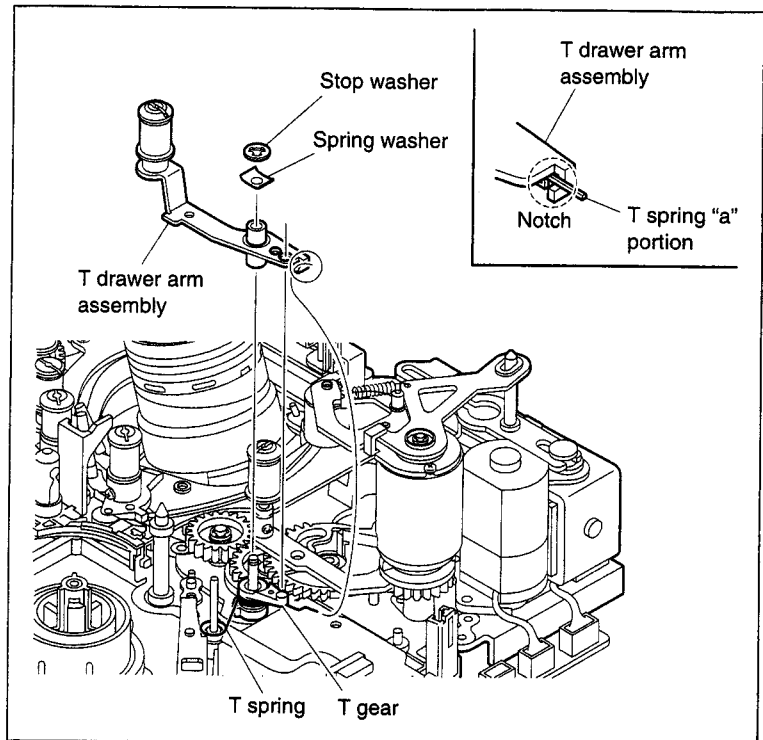
2. Checking the mounting position of the T gear

Check that the engagement between the T gear and No. 6 gear is in the position shown in the figure.

3. Reattaching the T drawer arm assembly

(1) Apply grease of 1/3 size of a rice grain to the shaft on the MD chassis.

(2) Fit a new T drawer arm assembly on the shaft and fit the hole in the T drawer arm assembly on the protrusion on the T gear.

(3) Hook again the portion "a" of the T spring unhooked in step 1- (2) on the notch in the T drawer arm assembly with tweezers.

(4) Fit the spring washer on the shaft on the MD chassis and fix it with the stop washer.

4. Cleaning the tape guide

Wipe the tape guide on the T drawer arm assembly with a cleaning cloth moistened with cleaning fluid.

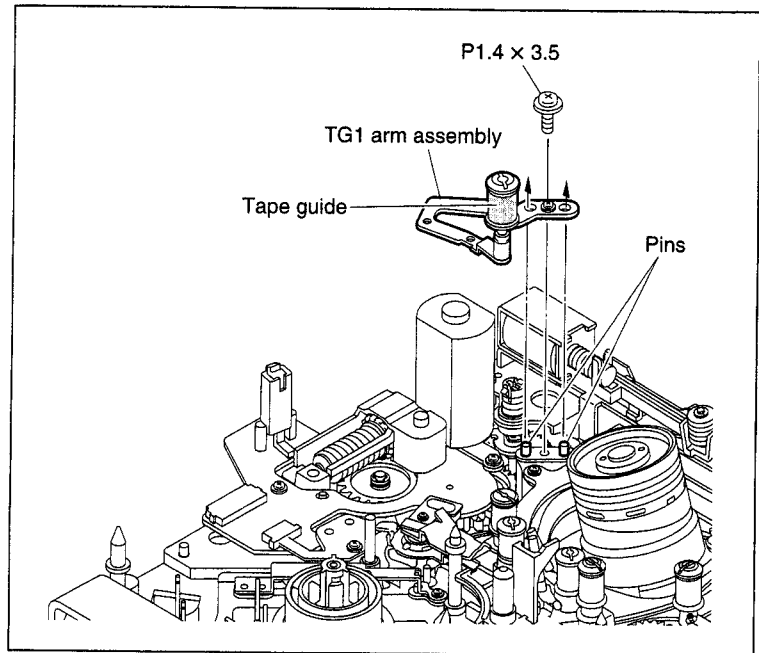## Adjustment after Cleaning

5. Checking the tape path adjustment

(Refer to Section 8-4.)
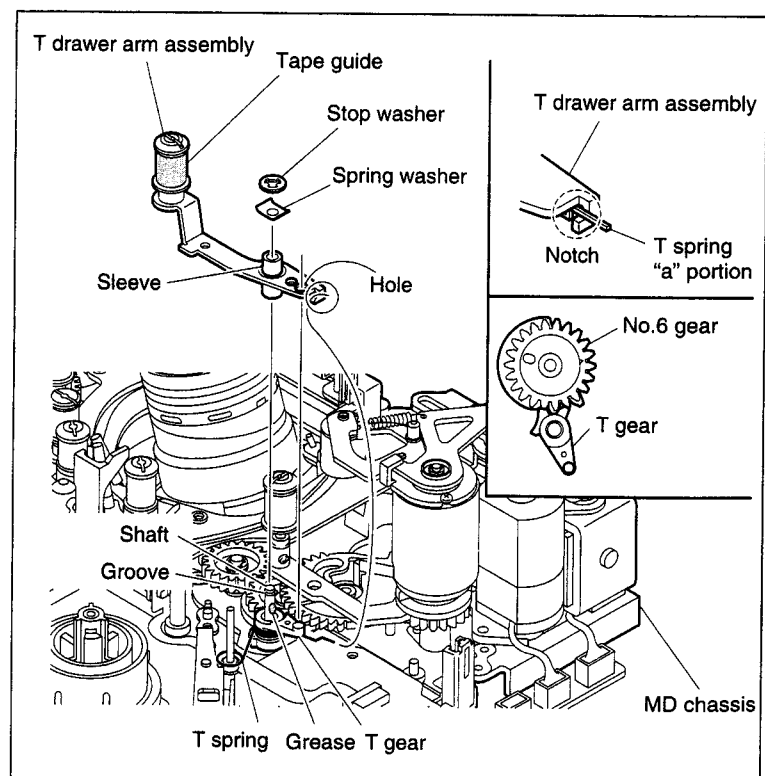
7-13. TG1 Arm Assembly Replacement

Outline

Replacement
Replacing the TG1 arm assembly
Cleaning the tape guide

Adjustment after replacement
TENSION adjustment
Checking the tape path adjustment

Note

Do avoid touching with bare hands to the tape cleaner a part of in TG1 arm assembly. Sharpness of the edge on the tape cleaner may cause a hand cut, therefore use extreme care when replacing the TG1 arm assembly.

Preparation

1. Set the unit to the unthreading end status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)
4. Remove the cassette compartment. (Refer to Section 3-4.)

Tools

- Torque screwdriver's bit (for M1.4) : J-6325-110-A
- Torque screwdriver (for 3 kgf•cm) : J-6325-400-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Replacement

1. Replacing the TG1 arm assembly

(1) Remove the screw and remove the TG1 arm
assembly from the MD chassis.

(2) Fit two holes in a new TG1 arm assembly on
the two pins on the MD chassis respectively
and fix the assembly with the screw.
Tightening Torque : 0.1 N•m {1 kgf•cm}

2. Cleaning the tape guide

Wipe the tape guide on the TG1 arm assembly
with a cleaning cloth moistened with cleaning
fluid.

Adjustment after Replacement

3. TENSION adjustment

(Refer to Section 5-3-4.)

4. Checking the tape path adjustment

(Refer to Section 8-4.)

7-14. TG8 Arm Assembly Replacement

Outline

Replacement

Replacing the TG8 arm assembly
Cleaning the tape guide

Adjustment after replacement

Checking the tape path adjustment

Preparation

1. Set the unit to the unthreading end status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)
4. Remove the cassette compartment. (Refer to Section 3-4.)

Tools

- Torque screwdriver's bit (for M1.4) :   J-6325-110-A
- Torque screwdriver (for 3 kgf·cm) :   J-6325-400-A
- Washer extracting fixture (A) :   J-6082-234-A
- Washer mounting fixture Ø1.5 :   J-6082-231-A
- Cleaning cloth :   3-184-527-01
- Cleaning fluid :   9-919-573-01
- Tweezers

Replacement

1. Replacing the TG8 arm assembly

(1) Insert a torque screwdriver through the square hole of the pinch limiter assembly to access the screw securing TG8 arm assembly. Remove the screw to remove the TG8 arm assembly.

(2) Fit a hole and a slotted hole in a new TG8 arm assembly on the two pins on the MD chassis and fix it with the screw.
Tightening Torque : 0.1 N•m {1 kgf•cm}

2. Cleaning the tape guide

Wipe the tape guide on the TG8 arm assembly with a cleaning cloth moistened with cleaning fluid.

Adjustment after Replacement

3. Adjustment after replacement

Checking the tape path adjustment
(Refer to Section 8-4.)

TG8 arm assembly
Tape guide
P1.4 × 3.5
Square hole of the pinch limiter assembly
Pin
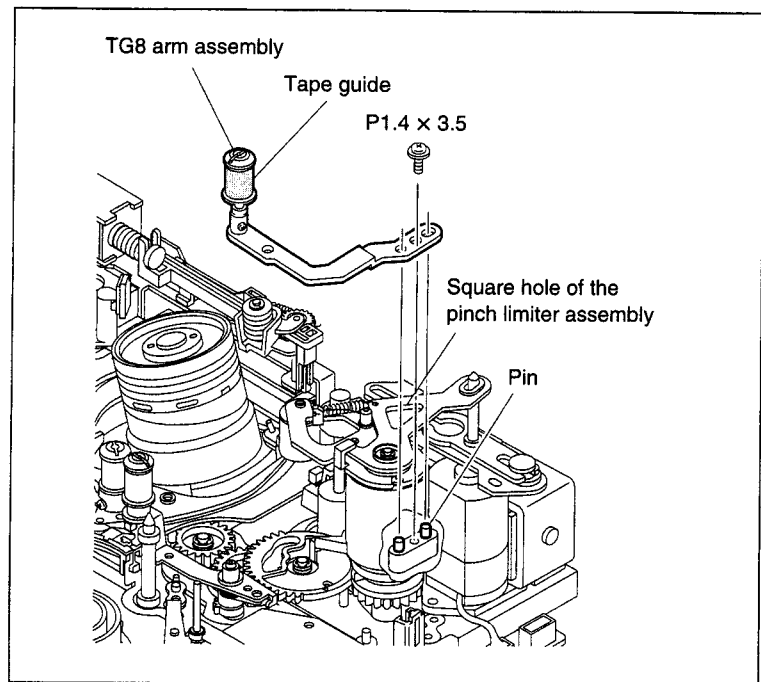
7-15. Rail Assembly Replacement

Outline

Replacement
Moving the S/T reel tables
Removing the S tension regulator assembly
Removing the T drawer arm assembly
Removing the RMP retainer (T1) assembly
Removing the head cleaner assembly
Removing the rail assembly
Reattaching the rail assembly
Reattaching the head cleaner assembly
Reattaching the RMP retainer (T1) assembly
Reattaching the T drawer arm assembly
Reattaching the S tension regulator assembly
Checking the threading/unthreading performance
Cleaning the tape guide

Adjustment after replacement
TENSION adjustment
Tape path adjustment

Note

Use extreme care not to scratch the drum and the tape guide when replacing the rail assembly.

Preparation

1. Set the unit to the unthreading end status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)
4. Remove the cassette compartment. (Refer to Section 3-4.)

Tools

- Torque screwdriver's bit (for M1.4) :   J-6325-110-A
- Torque screwdriver (for 3 kgf·cm) :   J-6325-400-A
- Cleaning cloth :   3-184-527-01
- Cleaning fluid :   9-919-573-01
- Tweezers

Replacement

1. Moving the S/T reel tables

Bring the S/T reel tables to the L cassette position (the most front side) by turning the reel shift motor gear in the arrow direction by a skewer.

Note

This provides easy operation of succeeding tasks.

2. Removing the S tension regulator assembly

Remove the S tension regulator assembly. (Refer to Section 7-11.)

3. Removing the T drawer arm assembly

Remove the T drawer arm assembly. (Refer to Section 7-12.)

4. Removing the RMP retainer (T1) assembly

Remove the two screws and remove the RMP retainer (T1) assembly.

5. Removing the head cleaner

Remove the head cleaner. (Refer to Section 7-21.)

6. Removing the rail assembly

(1) Disconnect the flexible card wire from the connector (CN2) on the SE-522 board.

Note

Use extreme care not to fold and not to scratch the flexible card wire when disconnecting.

S reel table

Reel shift motor gear

T reel table

SE-522 board

Connector (CN2)

Flexible card wire
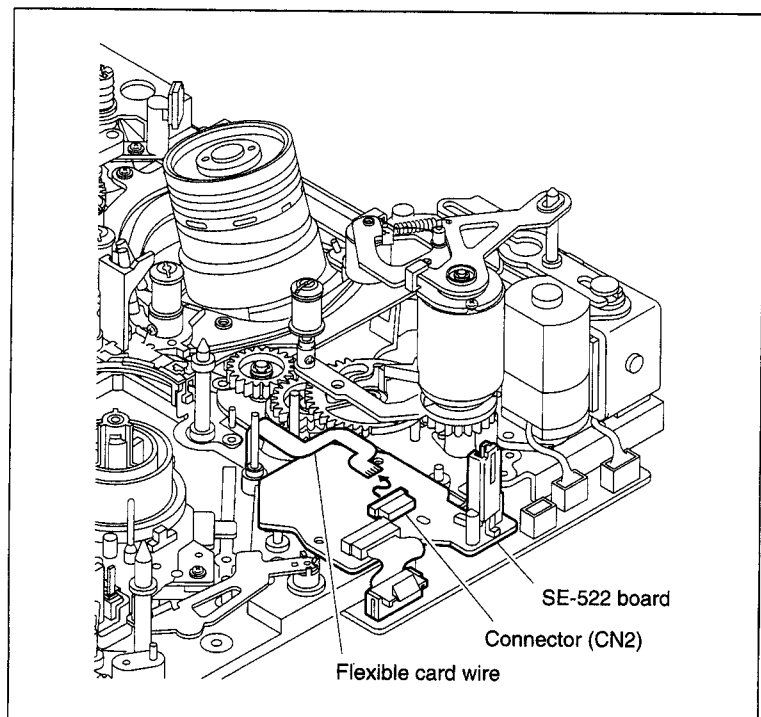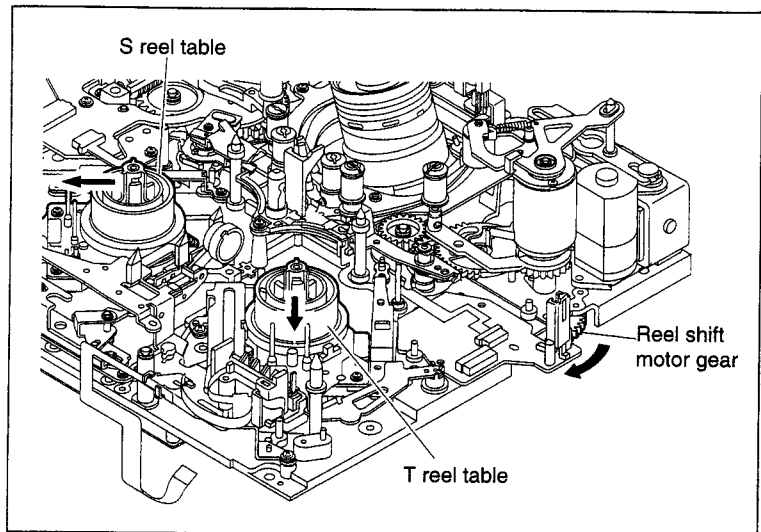
(2) Turn the manual eject cover clockwise and align the two phase determining holes in the mode gear assembly and in No.3 gear.

Mode gear

No.3 gear

Manual eject cover

Phase determining hole

Phase determining hole

Phase determining hole
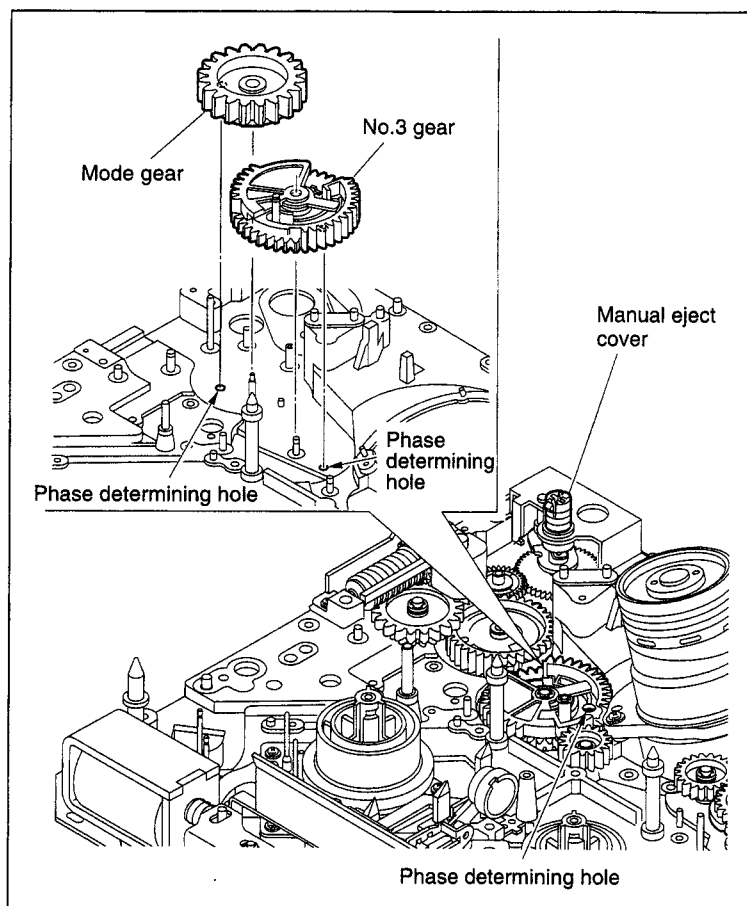
(3) Remove the three screws and remove the rail assembly.

| Note |

Use extreme care not to scratch the drum and the tape guide when removing. Also great care should be taken; not to fold and not to scratch the flexible card wire of the LED holder assembly when disconnecting.

P1.4 × 3.5

Rail assembly

Flexible card wire
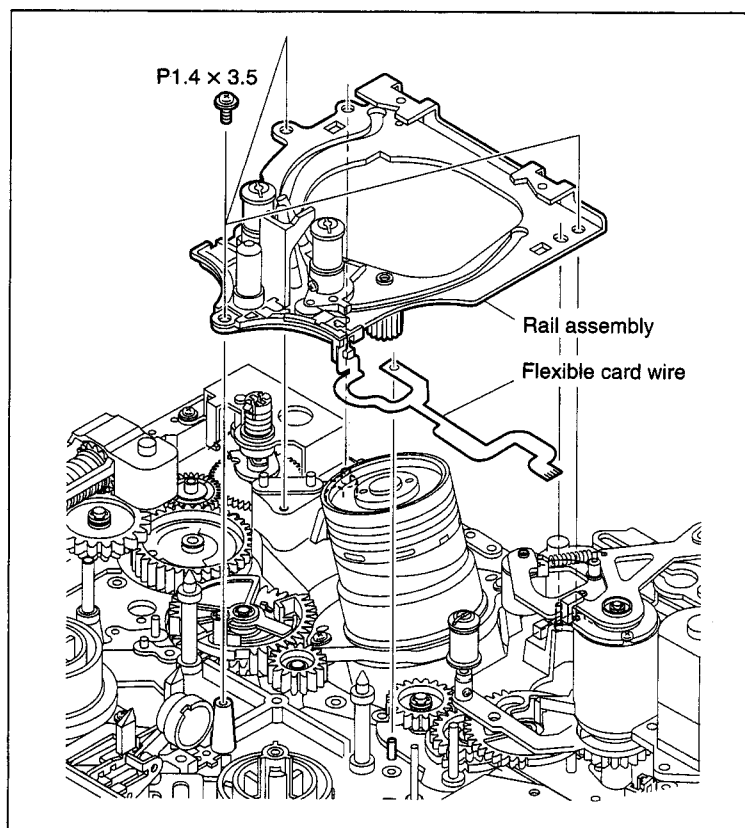
(4) Bring both shuttle (R) and shuttle (L) assemblies to the threading position shown in the figure, by turning the gear on the back side of the rail assembly by a finger

Shuttle (L) assembly

Rail assembly

Shuttle (R) assembly

Gear
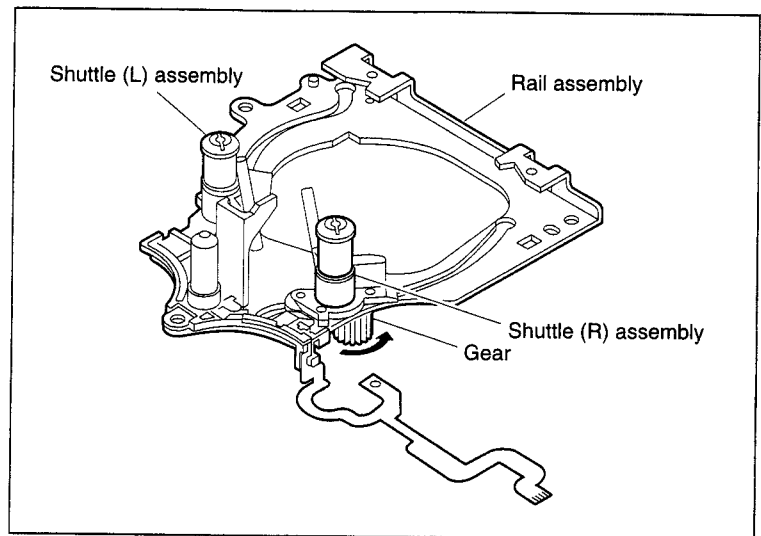
(5) Unlock each two claws located on the left, right and middle side of the LED holder assembly with tweezers, and remove the LED holder assembly from the rail assembly.

Claw

Claw

LED holder assembly
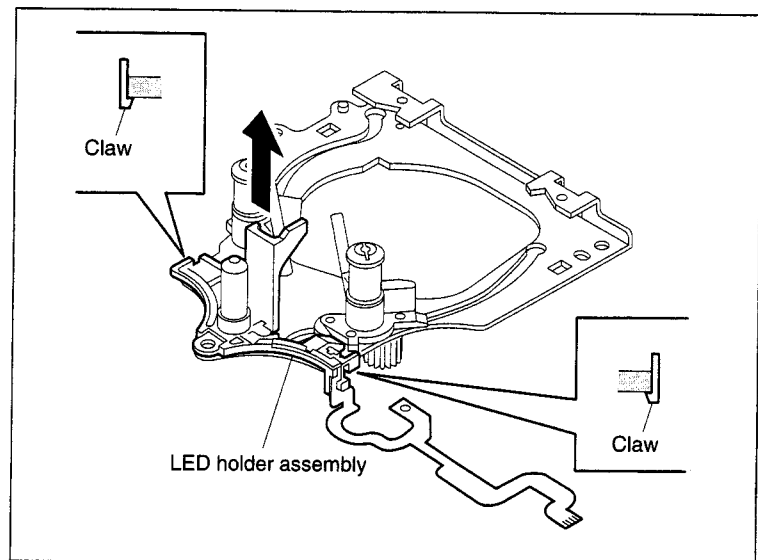
7. Reattaching the rail assembly

(1) Reattach a new rail assembly to the LED holder assembly.

(2) Ensure that the two phase determining holes in the mode gear assembly and in No.3 gear, which are already aligned in step 7- (2), are respectively aligned with the two holes in the MD chassis underneath each gear.

(3) Adjust the two phases determining holes in No.6 and No.7 gears to align respectively with the two holes in the MD chassis underneath each gear by turning No.7 gear by a finger.

No.6 gear
No.7 gear
No.6 gear
Phase determining hole
Phase determining hole
Phase determining hole
No.6 gear
Phase determining hole
No.7 gear
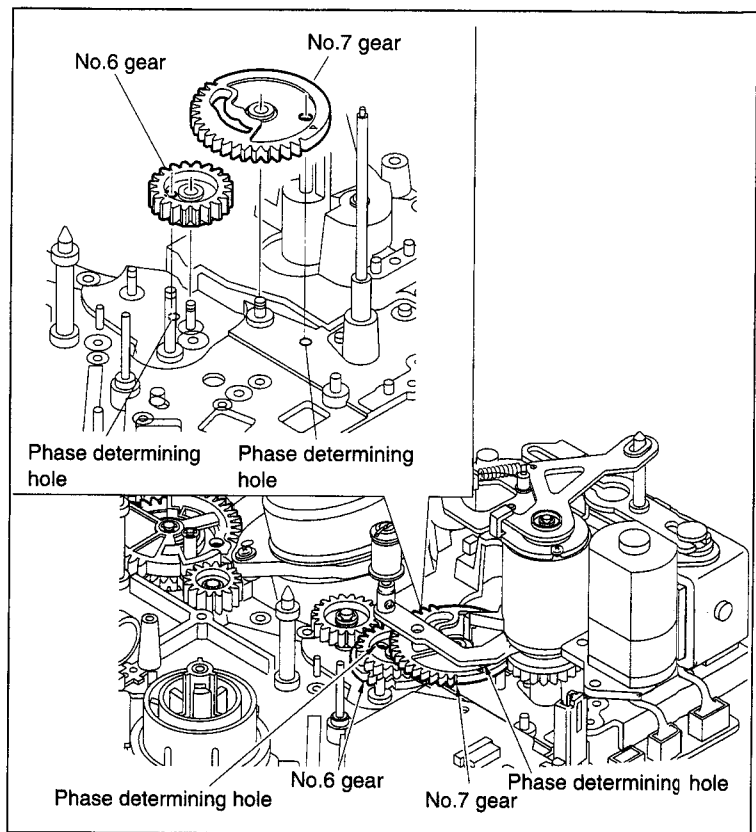
(4) Turn the gear on the back side of the rail assembly until the shuttle (R) and shuttle (L) assemblies push the LED holder assembly as far as it will go, and align the positioning hole of the shuttle (L) assembly with the positioning hole of the rail assembly.

Shuttle (L) assembly
Shuttle (R) assembly
Rail assembly
Gear
Positioning hole
Shuttle (L) assembly
Positioning hole
Rail plate
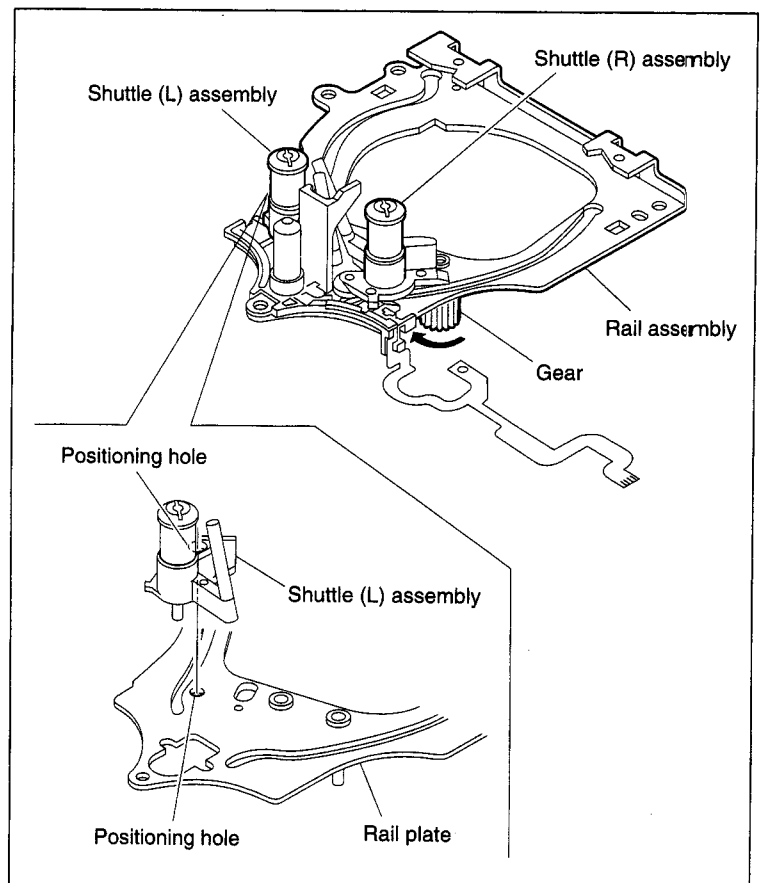
(5) Keeping the state in step (4) and further more holding the gear phase between S side and T side, fit the hole and slotted hole in the rail assembly on the two pins on the MD chassis respectively.

(6) Fit the hole in the flexible card wire of LED holder assembly on the pin on the MD chassis.

(7) Fix the rail assembly with the three screws. Tightening Torque : 0.1 N•m {1 kgf•cm}

(8) Reconnect the flexible card wire to the connector (CN2) on the SE-522 board.

8. Reattaching the head cleaner

Reattach the head cleaner. (Refer to Section 7-21.)

9. Reattaching the RMP retainer (T1) assembly

Fit the hole and slotted hole in the RMP retainer (T1) assembly on the pins on the MD chassis respectively, then fix it with the two screws.

10. Reattaching the T drawer arm assembly

Reattach the T drawer arm assembly.
(Refer to Section 7-12.)

11. Reattaching the S tension regulator assembly

Reattach the S tension regulator assembly.
(Refer to Section 7-11.)

12. Checking the threading/unthreading performance

Check the threading/unthreading is performed smoothly by turning the manual eject cover.

13. Cleaning the tape guide

Wipe the tape guides placed in followings with a cleaning cloth moistened with cleaning fluid.
• T drawer arm assembly
• S tension regulator assembly
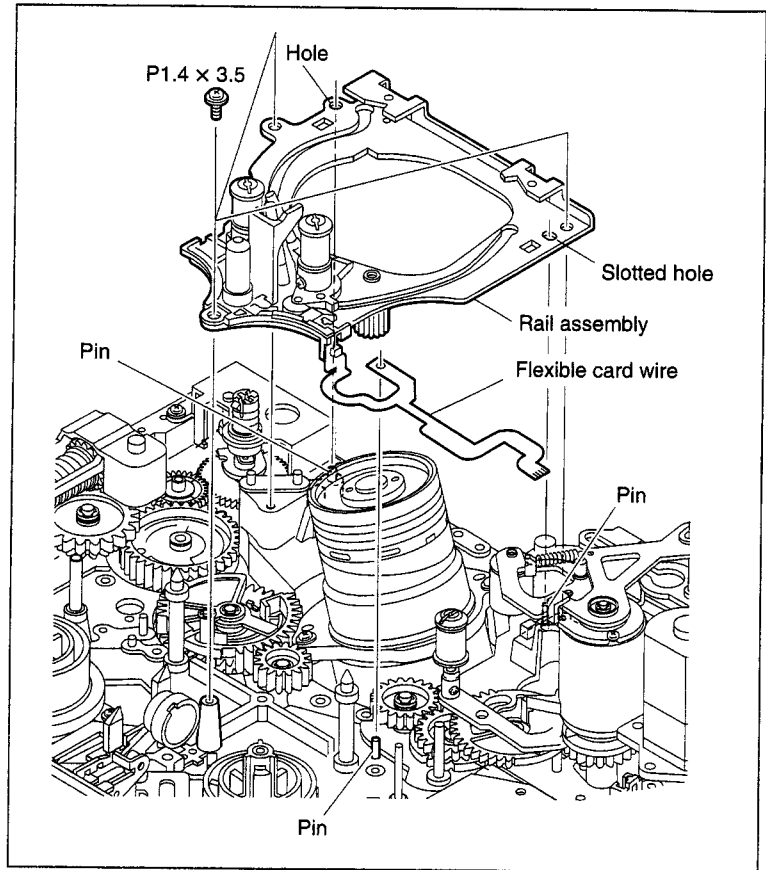• Shuttle (R) assembly
• Shuttle (L) assembly

Adjustment after Replacement

14. TENSION adjustment

(Refer to Section 5-3-4.)

15. Tape path adjustment

(Refer to Section 8-2.)

7-48

P1.4 × 3.5

Hole

Slotted hole

Rail assembly

Flexible card wire

Pin

Pin

Pin

7-16. Capstan Motor Replacement

Outline

Replacement

Removing the DR-428 board
Replacing the capstan motor
Reattaching the DR-428 board
Cleaning the capstan shaft

Adjustment after replacement

CAPSTAN ONLY adjustment
Checking the tape path adjustment

Preparation

1. Set the unit in to the unthreading end status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)
4. Remove the bottom panel. (Refer to Section 3-3.)
5. Remove the cassette compartment. (Refer to Section 3-4.)

Tools

- Torque screwdriver's bit (for M1.4) :   J-6325-110-A
- Torque screwdriver (for 3 kgf•cm) :   J-6325-400-A
- Cleaning cloth :   3-184-527-01
- Cleaning fluid :   9-919-573-01

Replacement

1. Removing the DR-428 board
(Refer to Section3-7.)

2. Replacing the capstan motor
(1) While supporting the capstan motor by hand from the back side of the MD chassis, remove the two screws in the upper side of the chassis to remove the capstan motor.
(2) Wipe the mounting surfaces of a new capstan motor and the MD chassis with a cleaning cloth moistened with cleaning fluid.
(3) Insert the new capstan motor into the hole in the MD chassis positioning as shown in the figure and fix it with the two screws.
Tightening torque : 0.1 N·m {1 kgf·cm}

| Note |

Use care not to scratch the capstan motor pivot when inserting the capstan motor.

(4) Reconnect the flexible card wire of the capstan motor on the back side of the unit to the connector (CN18) on the DR-428 board.

3. Reattaching the DR-428 board
(Refer to Section3-7.)

4. Cleaning the Capstan shaft
Wipe the capstan shaft with a cleaning cloth moistened with cleaning fluid.
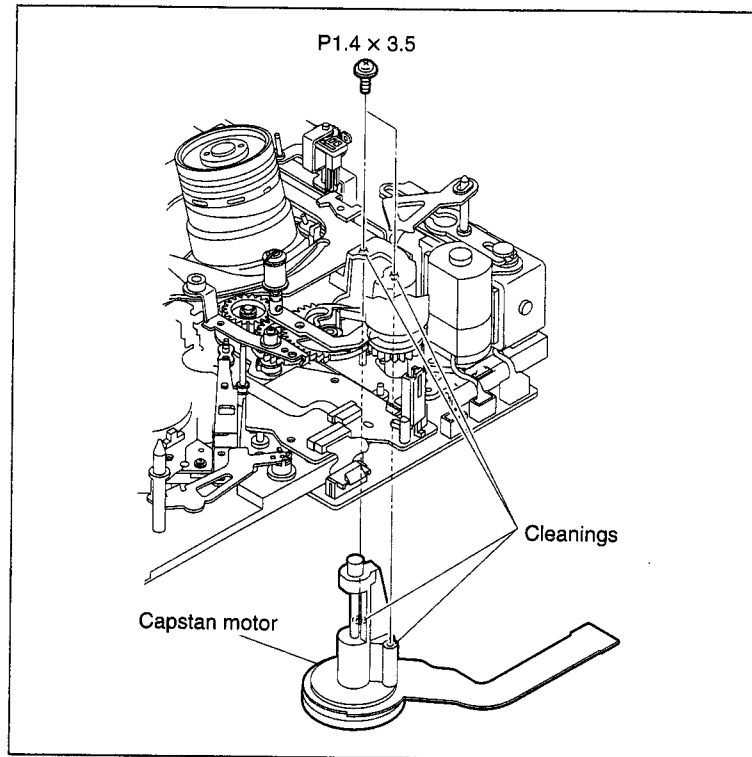
Adjustment after Replacement

5. CAPSTAN ONLY adjustment
(Refer to Section 5-3-4.)

6. Checking the tape path adjustment
(Refer to Section 8-4.)

P1.4 × 3.5

Cleanings

Capstan motor

7-17. Loading Motor Replacement

Outline

Replacement
Disconnecting the connector
Replacing the loading motor assembly
Reconnecting the connector

Preparation

1. Set the unit to the unthreading end status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)
4. Remove the cassette compartment. (Refer to Section 3-4.)

Tools

- Torque screwdriver's bit (for M1.4) :   J-6325-110-A
- Torque screwdriver (for 3 kgf·cm) :   J-6325-400-A
- Tweezers

Replacement

1. Disconnecting the connector
Disconnect the harness from the connector (CN10) on the DR-428 board with tweezers.

2. Replacing the loading motor assembly
(1) Remove the two screws to remove the loading motor assembly.
(2) Align a positioning hole in a new loading motor with the positioning pin on the MD chassis and engage the motor gear with the FG gear.
(3) Fix the loading motor assembly with the two screws.
    Tightening Torque : 0.1 N·m {1 kgf·cm}

3. Reconnecting the connector
Reconnect the harness to the connector (CN10) on the DR-428 board with tweezers.
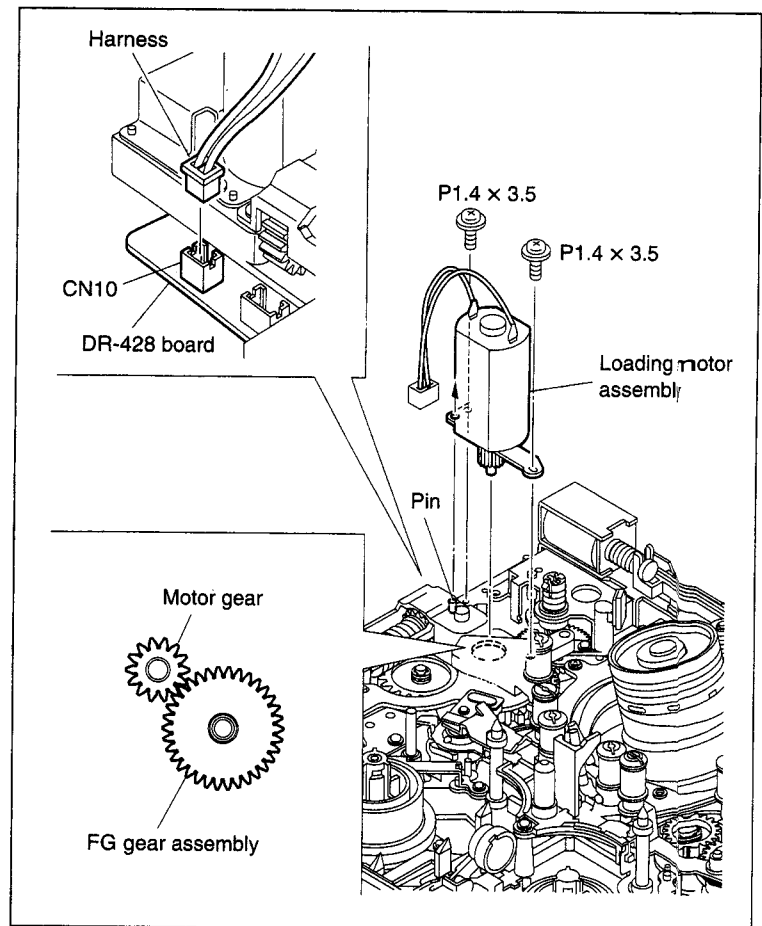
7-18. Reel Shift Motor Assembly Replacement

Replacement
Removing the pinch limiter assembly
Removing the pinch solenoid assembly
Replacing the reel shift motor assembly
Reattaching the pinch solenoid assembly
Reattaching the pinch limiter assembly

Note

Prepare a new stop washer when replacing the reel shift motor assembly.
Stop washer (1.5) : 3-669-465-01 × 1 (for mounting the pinch limiter assembly)

Preparation

1. Set the unit to the unthreading end status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3)
4. Remove the cassette compartment. (Refer to Section 3-4)

Tools

- Torque screwdriver's bit (for M1.4) :   J-6325-110-A
- Torque screwdriver (for 3 kgf•cm) :   J-6325-400-A
- Washer extracting fixture (A) :   J-6082-234-A
- Washer mounting fixture Ø1.5 :   J-6082-231-A
- Cleaning cloth :   3-184-527-01
- Cleaning fluid :   9-919-573-01
- Tweezers

Replacement

1. Removing the pinch limiter assembly

Remove the pinch limiter assembly.
(Refer to Section 7-5.)

2. Removing the pinch solenoid assembly

Remove the pinch solenoid assembly.
(Refer to Section 7-7.)

3. Replacing the reel shift motor assembly

(1) Disconnect the harness of the reel shift motor assembly from the connector (CN21) on the DR-428 board with tweezers.

(2) Remove the screw to remove the reel shift motor assembly.

(3) Fit two holes in a new reel shift motor assembly shown in the figure on the two pins on the MD chassis and engage it with the gear A.

(4) Reattach the reel shift motor assembly with the screw.
Tightening Torque : 0.1 N•m {1 kgf•cm}

(5) Reconnect the harness of the reel shift motor to the connector (CN21) on the DR-428 board.

4. Reattaching the pinch solenoid assembly

Reattach the pinch solenoid assembly.
(Refer to Section 7-7.)

5. Reattaching the pinch limiter assembly

Reattach the pinch limiter assembly.
(Refer to Section 7-5.)

P1.4 × 3.5
Reel shift mortor assembly
Positioning hole
Gear
Pin
CN21
DR-428 board
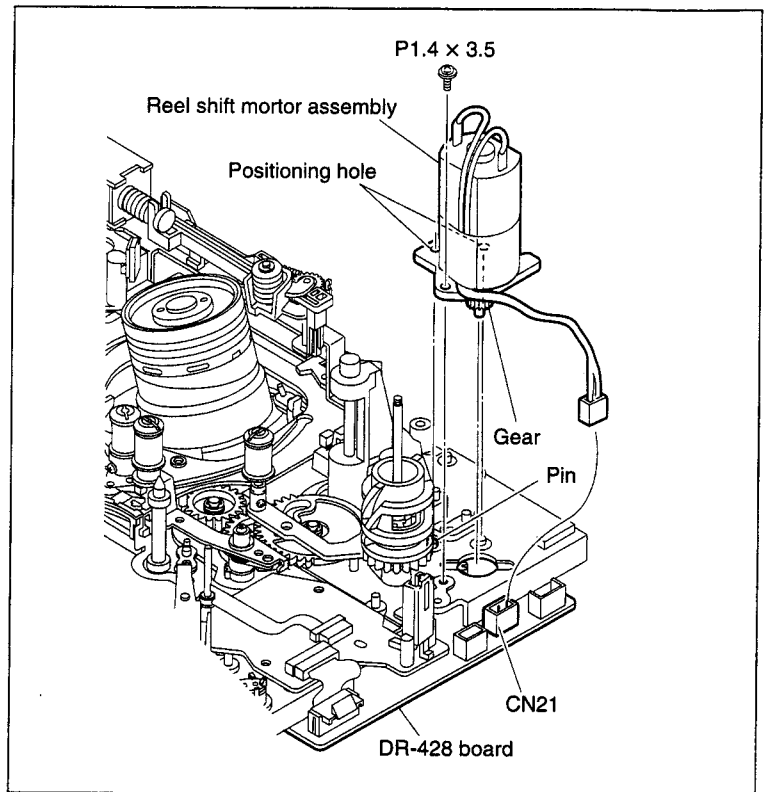
7-19. MIC Assembly Replacement

Outline

Replacement
Disconnecting the flexible card wire
Moving the S/T reel tables
Removing the L push plate
Removing the MIC spring
Replacing the MIC assembly
Moving the S/T reel tables
Reattaching the MIC spring
Reattaching the L push plate
Reconnecting the flexible card wire

Note

Prepare a new stop washer when replacing the MIC assembly.
Stop washer (1.5) : 3-699-465-01
Do avoid touching the terminal on the MIC holder and wiping it with cleaning fluid.
When need cleaning, wipe it carefully with a soft dry cloth.
Use care not to lose a poly-slider washer between the base plate and the MIC assembly.

Preparation

1. Set the unit to the unthreading end status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)
4. Remove the cassette compartment. (Refer to Section 3-4.)

Tools

- Torque screwdriver's bit (for M1.4) :   J-6325-110-A
- Torque screwdriver (for 3 kgf•cm) :   J-6325-400-A
- Washer extracting fixture (A) :   J-6082-234-A
- Washer mounting fixture Ø1.5 :   J-6082-231-A
- Tweezers

Replacement

1. Disconnecting the flexible card wire

Disconnect the flexible card wire from the connector (CN16) on the DR-428 board located on the back side of the MD chassis.

MIC assembly
flexible card wire

Connector (CN16)

DR-428 board
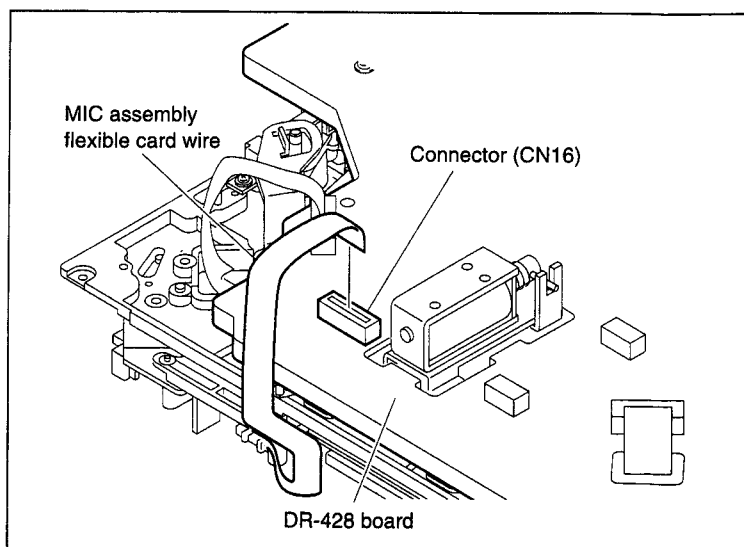
2. Moving the S/T reel tables

Turn the reel shift motor gear in the arrow direction by a skewer and bring the S/T reel tables to the standard cassette position (the most front side).
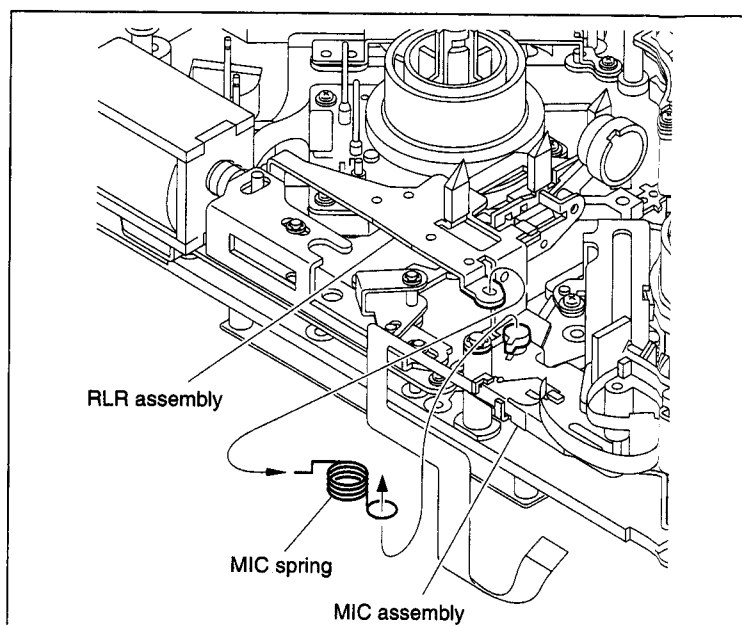
3. Removing the L push plate

Remove the L push plate. (Refer to Section 7-3.)

S reel table

Reel shift
motor gear

T reel table
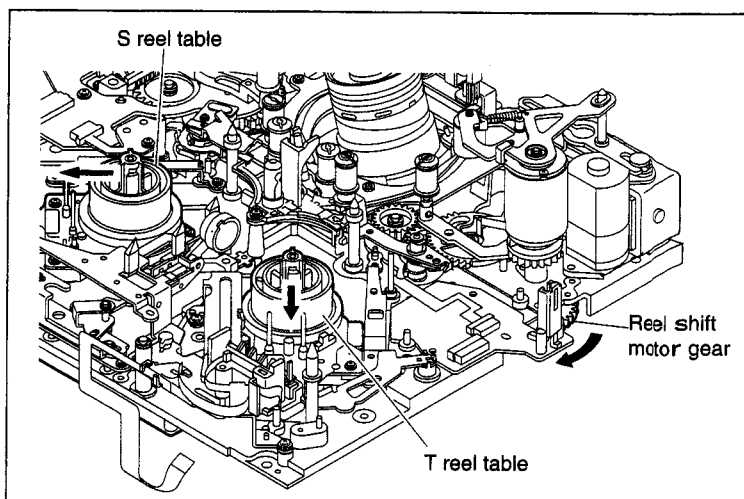
4. Removing the MIC spring

Unhook the hooks on the both ends of the MIC spring which hold the MIC arm and the RLR assemblies.

RLR assembly

MIC spring

MIC assembly

5. Replacing the MIC assembly

(1) Remove the stop washer and the two screws which secure the MIC assembly to the MD chassis, and remove the MIC assembly.

(2) Insert a tip of the flexible card wire of a new MIC assembly between the chassis and the front MD chassis to bring it to the back side of the unit.

| Note |

Use great care not to fold and scratch the flexible card wire during this operation.

(3) Fit the boss of the MIC arm on the shaft of the MD chassis and also fit the recess on the reel plate shaft.
Fit the two guide holes in the MIC assembly on the pins on the MD chassis, and fix the assembly with the two screws and a new stop washer.
Tightening Torque : 0.1 N•m {1 kgf•cm}

P1.4 × 3.5
MIC assembly
Guide hole
Stop washer
P1.4 × 3.5
Boss of MIC arm
Recess
Flexible card wire
Guide hole
Pin
Reel plate shaft
Pin
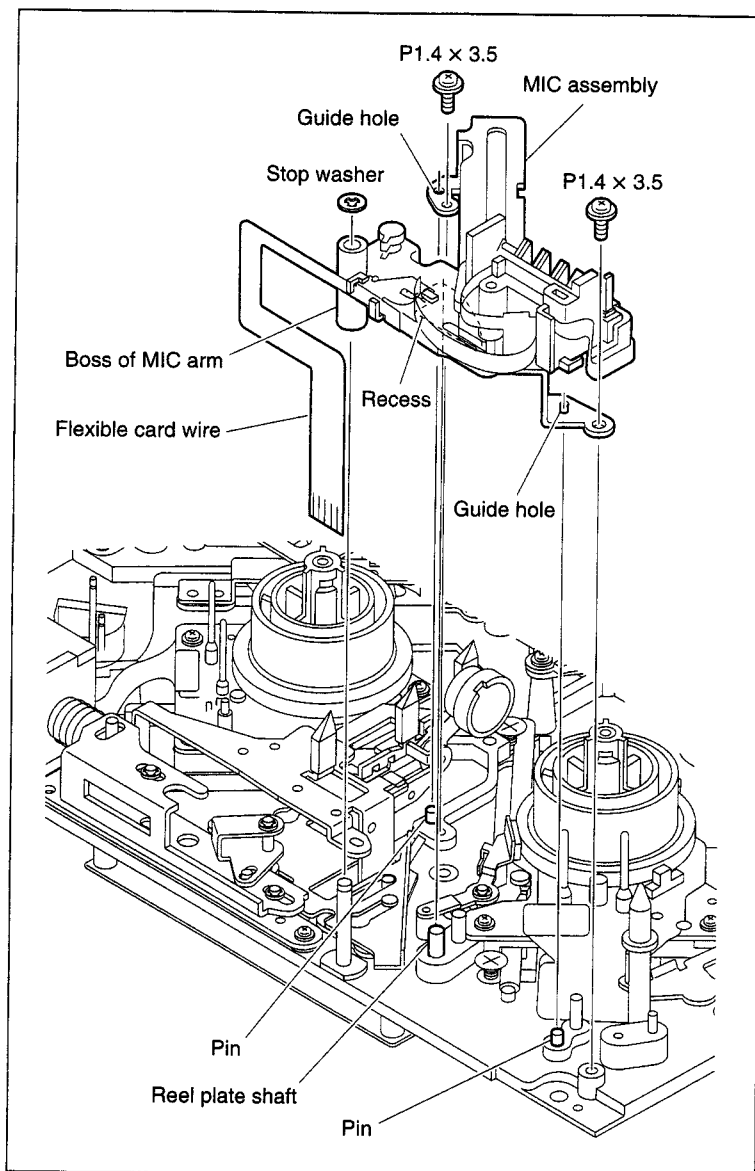
6. Moving the S/T reel tables

Turn the reel shift motor gear in the arrow direction by a skewer and bring the S/T reel tables to the S-cassette position (the drum side). Confirm that the S/T reel tables and the MIC assembly shift smoothly.

S reel table

Reel shift motor gear

T reel table
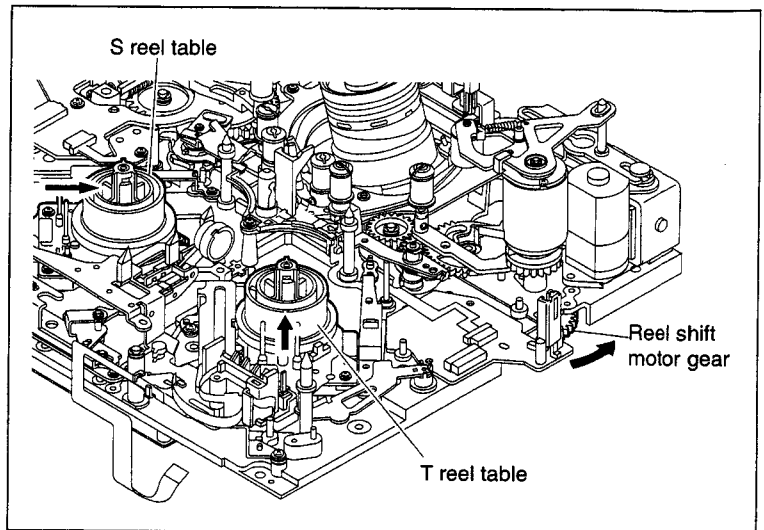
7. Reattaching the MIC spring

Reattach the MIC spring removed in step 5 to the MIC arm and RLR assemblies.
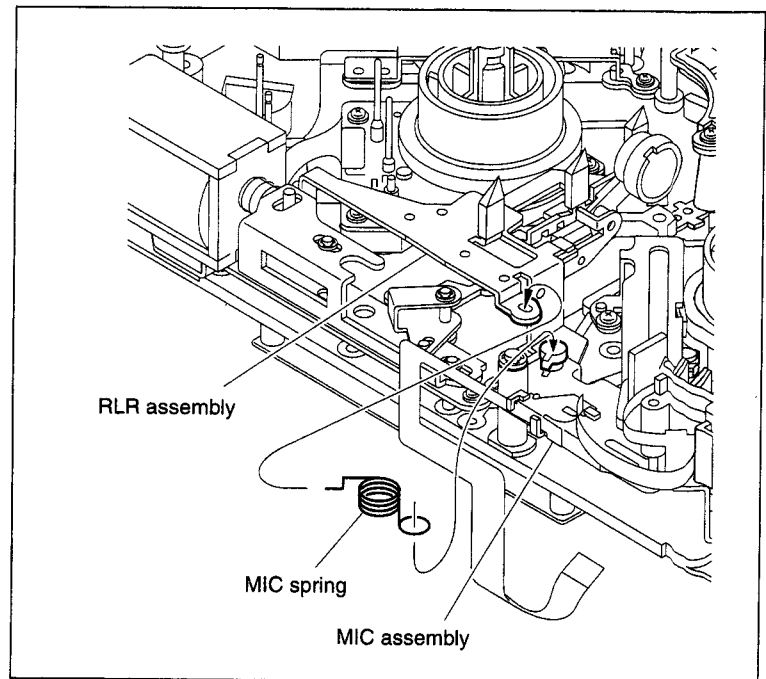
8. Reattaching the L push plate

Reattach the L push plate. (Refer to Section 7-3.)

9. Reconnecting the flexible card wire

Reconnect the flexible card wire to the connector (CN16) on the DR-428 board located on the back side of the MD chassis.

10. Reattaching the MD assembly

Reattach the MD assembly.
(Refer to Section 3-5.)

RLR assembly

MIC spring

MIC assembly

7-20. MIC Holder Assembly Replacement

Outline

Replacement
Removing the MIC assembly
Replacing the MIC holder assembly
Reattaching the MIC assembly

Note

Prepare new stop washers when replacing the MIC holder.
Stop washer (1.2) : 3-559-408-11 × 2 (for mounting the MIC holder assembly)
Stop washer (1.5) : 3-669-465-01 × 1 (for mounting the MIC assembly)
Do avoid touching the terminal on the MIC holder and wiping it with cleaning fluid.
When need cleaning, wipe it carefully with a soft dry cloth.
Use care not to lose a poly-slider washer between the base plate and the MIC assembly.

Preparation

1. Set the unit to the unthreading end status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)
4. Remove the cassette compartment. (Refer to Section 3-4.)

Tools

- Torque screwdriver's bit (for M1.4) :   J-6325-110-A
- Torque screwdriver (for 3 kgf·cm) :   J-6325-400-A
- Washer extracting fixture (A) :   J-6082-234-A
- Washer mounting fixture Ø1.5 :   J-6082-231-A
- Washer mounting fixture Ø1.2 :   J-6082-232-A
- Tweezers

Replacement

1. Removing the MIC assembly

Remove the MIC assembly.
(Refer to Section 7-19.)

### 2. Replacing the MIC holder subassembly

(1) Remove the portion A shown of the flexible card wire from the MIC arm assembly as shown in the figure.

(2) Remove the two stop washers from the back side of the MIC assembly and remove the MIC holder assembly.

(3) Fix a new MIC holder assembly to the MIC assembly with two new stop washers (1.2).

| Note |

Use great care not to fold and not to scratch the flexible card wire when reattaching.
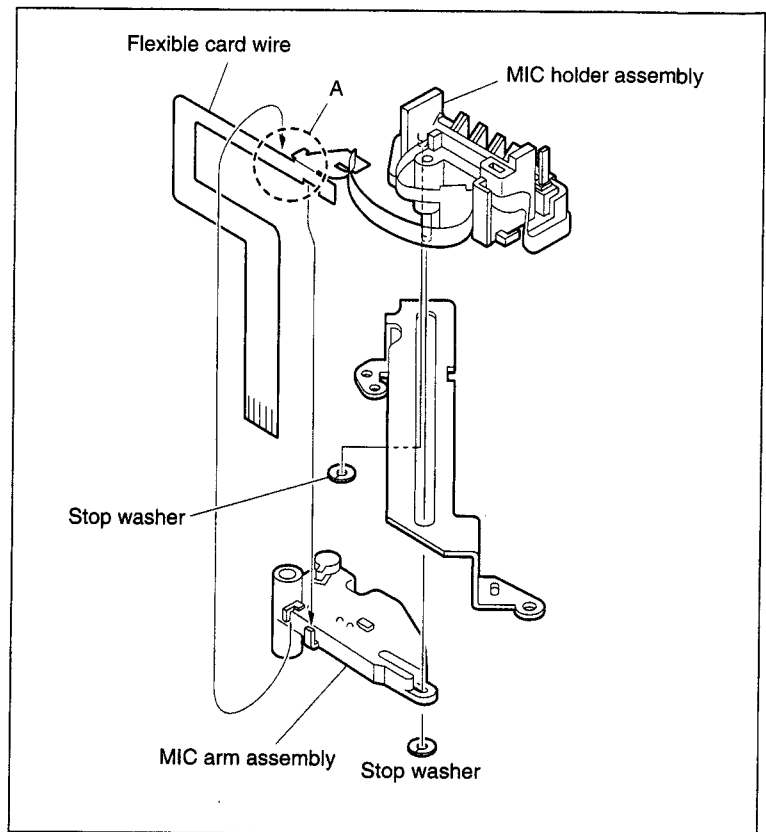
(4) Fix the flexible card wire to the MIC arm assembly as shown in the figure.

(5) Insert a tip of the flexible card wire of the MIC assembly between the chassis and the front MD chassis to bring it to the back side of the unit.

| Note |

Use extreme care not to fold and not to scratch the flexible card wire at this operation.

3. Reattaching the MIC assembly

Reattach the MIC assembly.
(Refer to Section 7-19.)
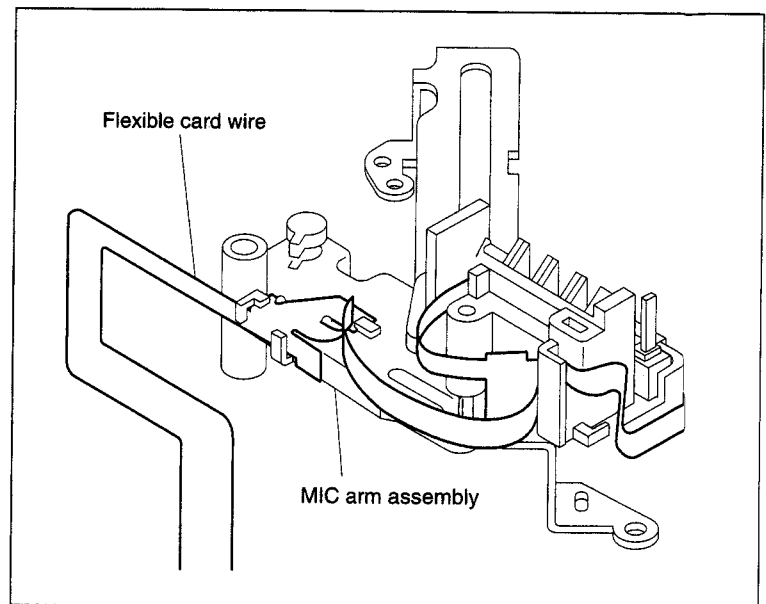
7-21. HC Roller Assembly Replacement

Replacement
Disconnecting the connector
Removing the head cleaner assembly
Replacing the HC roller assembly
Reattaching the head cleaner assembly
Checking the performance of the head cleaner assembly
Reconnecting the connector

Note

Prepare a new stop washer when replacing the HC roller assembly.
Stop washer (0.8) : 3-315-414-31 × 1
Bare-handed touch to the HC roller assembly is prohibited. Do put on cloth gloves
before replacing.

Preparation

1. Set the unit to the unthreading end status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)

Tools

- Torque screwdriver's bit (for M1.4) :   J-6325-110-A
- Torque screwdriver (for 3 kgf•cm) :   J-6325-400-A
- Washer extracting fixture (A) :   J-6082-234-A
- Washer mounting fixture Ø1.8 :   J-6082-233-A

Replacement

1. Disconnecting the connector

Disconnect the harness from the connector
(CN11) on the DR-428 board with tweezers.

2. Removing the head cleaner assembly

Remove the two screws and pull off the head
cleaner assembly in the arrow direction.

P1.4 × 3.5

Head cleaner assembly

P1.4 × 3.5

CN11
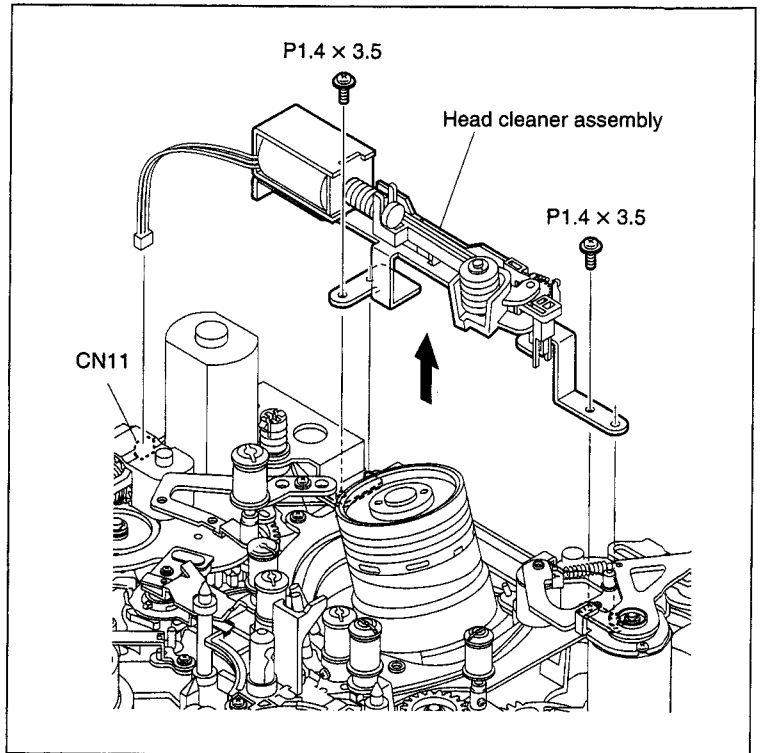
3. Replacing the HC roller assembly

(1) Remove the stop washer to remove the HC
roller assembly.
(2) Attach a new HC roller assembly with a new
stop washer.

   Note

   Avoid bare-handed touch to the HC roller
   assembly.
   In addition, do not give an excessive force to
   it at removal and reattachment, it may cause
   deformation.
   Operation supporting the back side of the HC
   roller assembly by fingers is required.

Stop washer

HC roller assembly

HC roller arm assembly
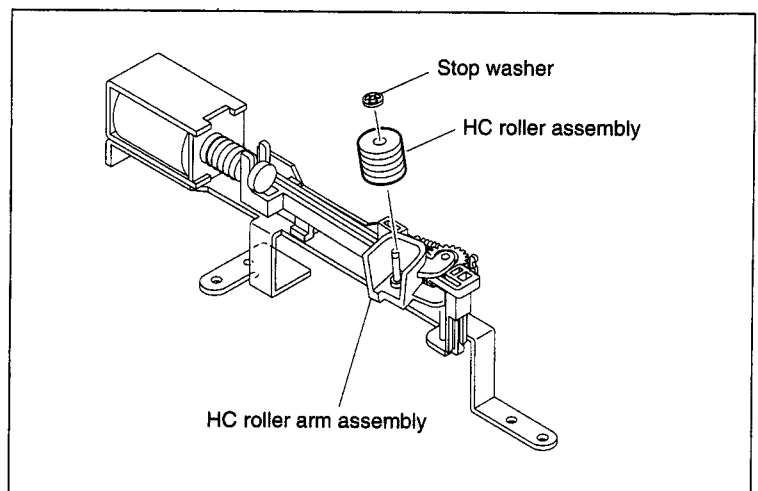
4. Reattaching the head cleaner assembly

Align the two positioning holes in the head cleaner assembly with the two positioning pins on the MD chassis and fix the assembly with the two screws.

Tightening torque : 0.1 N•m {1 kgf•cm}
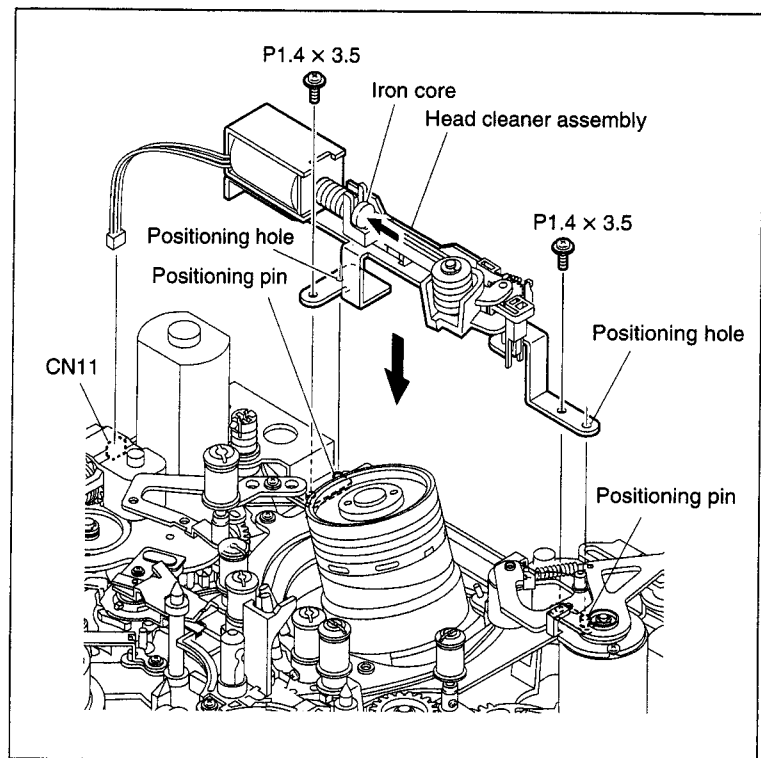
5. Checking the performance of the head cleaner assembly

Check that the HC roller assembly contacts the drum assembly in parallel when the solenoid's iron core of the head cleaner assembly is in the pull-in state by being pressed in the arrow direction.

6. Reconnecting the connector

Reconnect the harness to the connector (CN11) on the DR-428 board.
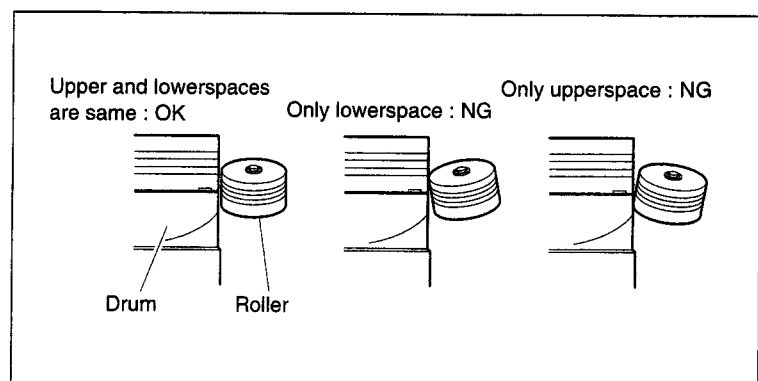
7-22. Head Cleaner Solenoid Replacement

Outline

Replacement
Removing the head cleaner assembly
Replacing the head cleaner solenoid
Reattaching the head cleaner assembly
Checking the performance of the head cleaner assembly

Preparation

1. Set the unit to the unthreading end status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)

Tools

- Torque screwdriver's bit (for M1.4) :   J-6325-110-A
- Torque screwdriver (for 3 kgf•cm) :   J-6325-400-A

Replacement

1. Removing the head cleaner assembly

Remove the head cleaner assembly.
(Refer to Section 7-21.)

2. Replacing the head cleaner solenoid

(1) Remove the two screws on the back side of the head cleaner assembly.
(2) Remove the solenoid with the spring on it.
(3) Remove the compression coil spring from the solenoid.
(4) Fit the compression coil spring on a new solenoid's iron core.
(5) Pull out the iron core until a recess comes in sight, then fix the solenoid to the head cleaner assembly.
(6) Align the two holes in the solenoid with the two slotted holes in the HC base assembly and fix temporally with the two screws.

| Note |

Tighten the screws just enough to move the head cleaner solenoid.

(7) Adjust the solenoid position to meet the specification of the clearance between the slit portion of the head cleaner base assembly and the tip of the HC slider under the condition that the iron core comes to the pull-in state by being pressed in the arrow direction, then tighten the two screws.
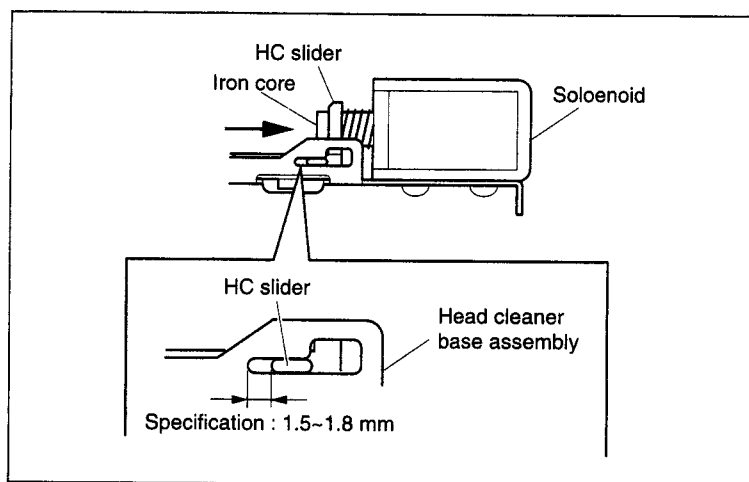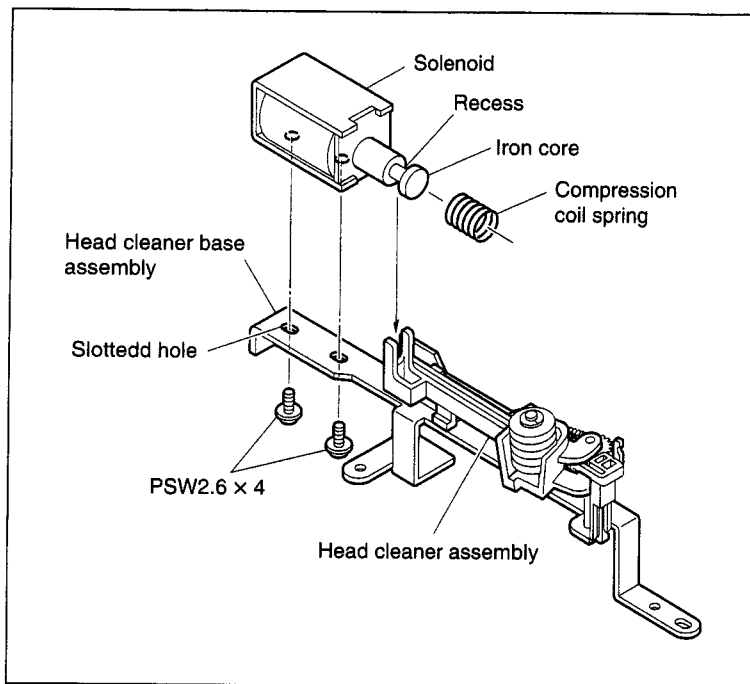Tightening torque : 0.2 N·m {2 kgf·cm}

3. Reattaching the head cleaner assembly

Reattach the head cleaner assembly.
(Refer to Section 7-21.)

4. Checking the performance of the head cleaner assembly

Check the performance of the head cleaner assembly. (Refer to Section 7-21.)

7-23. Cassette Compartment Motor Replacement

Outline

Replacement
Removing the motor gear assembly
Replacing the motor assembly
Reattaching the motor gear assembly

Preparation

1. Set the unit to the unthreading end status.
2. Power off the unit.
3. Remove the top panel. (Refer to Section 3-3.)
4. Remove the cassette compartment. (Refer to Section 3-4.)

Tools

- Torque screwdriver (for 3 kgf•cm) :   J-6325-400-A
- Torque screwdriver's bit (for M2) :   J-6325-380-A
- Grease (SGL-941) :   7-662-001-39
- Tweezers

Replacement

1. Removing the motor gear assembly
(1) Remove the harness of the motor gear from the connector (CN3) on the CC-83 board in the cassette compartment.
(2) Remove the motor gear assembly from the cassette compartment by removing the two screws.
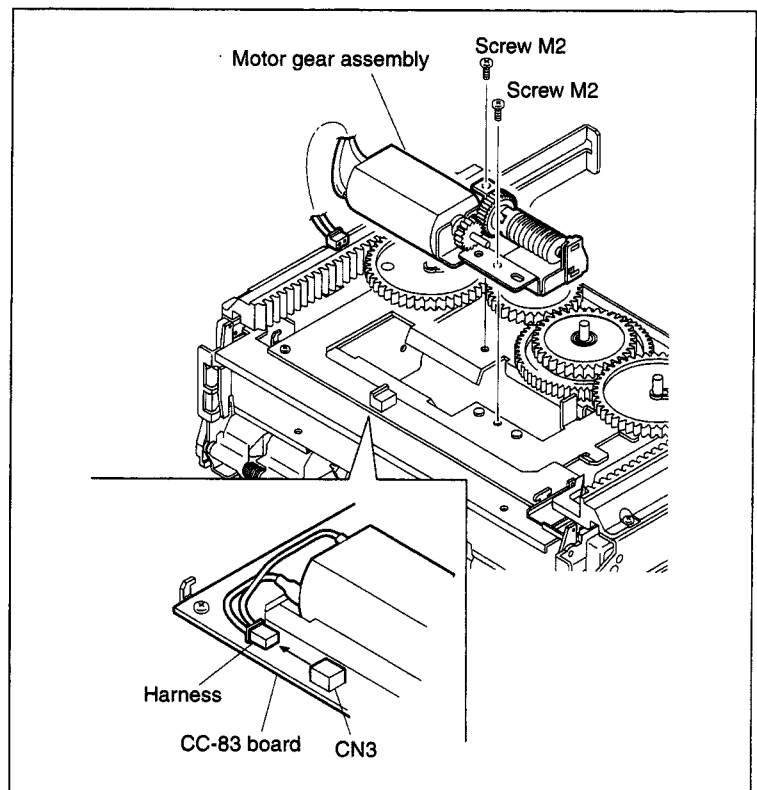
2. Replacing the motor assembly

(1) Release the upper and lower claws of the pivot bracket to remove the pivot bracket.

Note

Be careful not to lose the worm gear, which also comes off at this operation.

(2) Remove the gear B from the shaft of the motor bracket assembly.

(3) Remove the two screws to remove the motor assembly from the motor bracket.

(4) Fix a new motor assembly to the motor bracket positioning as shown in the figure with the two screws.

Note

Be reminded a new motor assembly has the gear A on its shaft.

Tightening torque : 0.2 N•m {2 kgf•cm}

(5) Reattach the gear B to the shaft of the motor bracket assembly.

(6) Make a coupling between the worm gear and the gear B and insert the pivot bracket shaft from another side of the worm gear.

(7) Fix the upper and lower claws to the motor bracket.
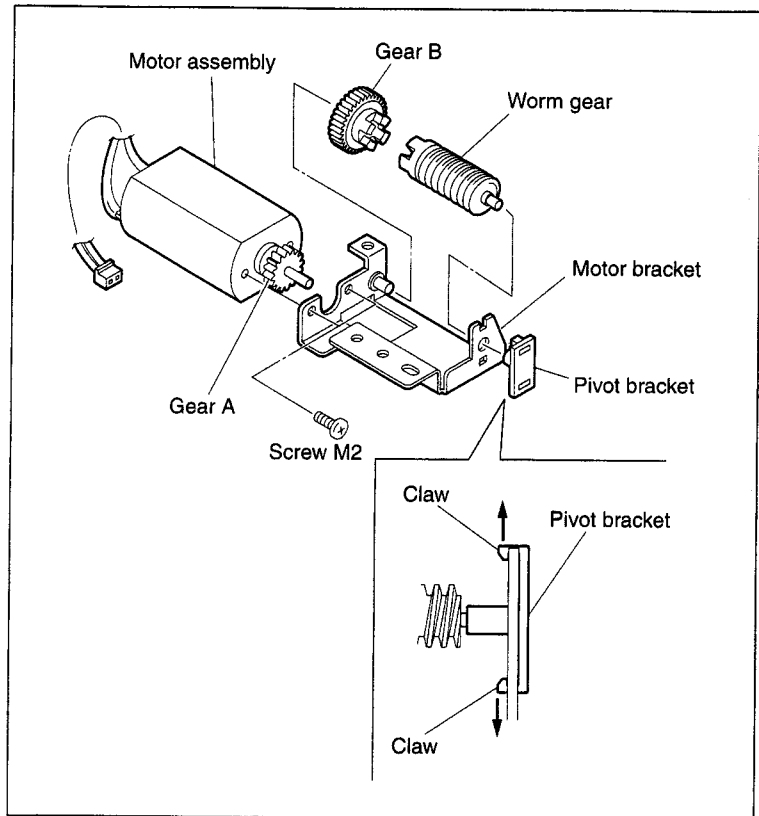
3. Reattaching the motor gear assembly

(1) Bend the two terminals in the motor gear assembly to meet the specification of their bent angle shown in the figure.

(2) With the worm gear in the motor gear assembly engaged with the worm wheel, insert the two protrusions of the motor gear assembly into the holes in the cassette compartment and fix with two screws.

(3) Align the hole in the drive gear (L) assembly with the hole in the cassette compartment by turning the gear B of the motor gear assembly by a finger.

(4) Apply a grain of grease on the worm gear in the motor gear assembly.

(5) Reconnect the harness of the motor gear assembly to the connector (CN3) on the CC-83 board.
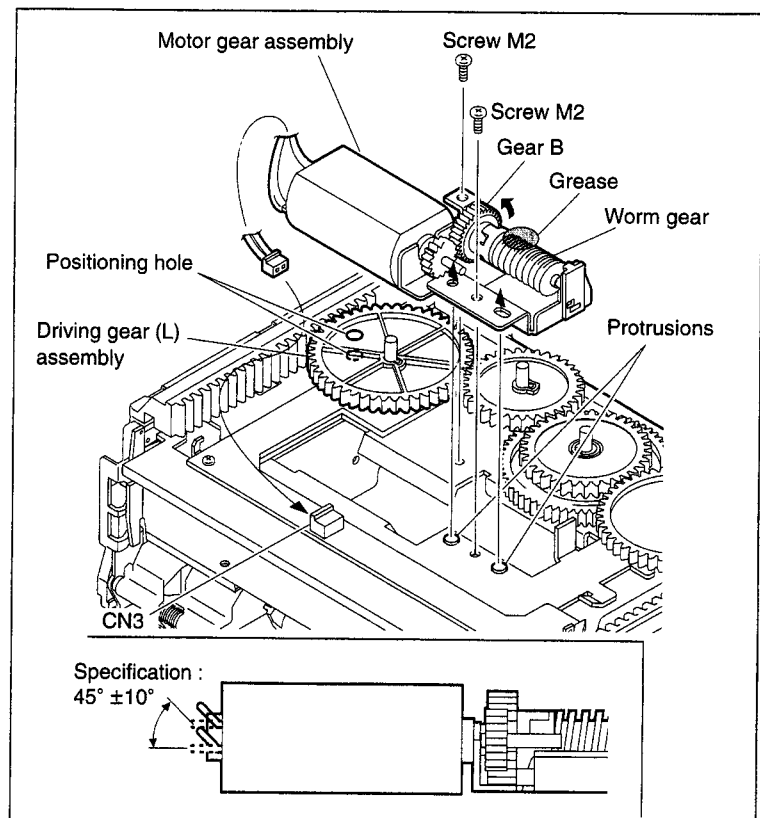
Section 8
Tape Path Alignment

Tape path adjustment is very important adjustment to run tape under the optimum conditions for tape.

If this adjustment is not performed correctly, tape may be damaged.

Perform this adjustment with utmost attention.

Perform this adjustment after the cassette compartment assembly is removed from VTR.

8-1. General Information for Tape Path Adjustment

Tools

1. Alignment tape
The following alignment tapes are necessary for tape path adjustment.
- XH2-1AST (Standard cassette) :   8-967-999-02
- XH5-1A2 (Mini cassette) :   8-967-999-22 (NTSC)
- XH5-1AP2 (Mini cassette) :   8-967-999-26 (PAL)

2. Tape guide adjustment driver
The following tape guide adjustment driver which is available as the Sony service tool is necessary for height adjustment of tape guide.
- Tape guide adjustment driver :   J-6082-362-A

3. Tape path adjustment tool
Use the following tape path adjustment tool to parforme the tape path adjustment.
- Tape path adjustment board, DJ-461 :   J-6444-610-B
- Tape path tool connection cable, DJ-472 :   J-6444-720-A
- Tape path tool power supply cable, DJ-500 : J-6445-000-A

4. The required tools in addition to the above listed tools.
- DC regulated power supply
- Oscilloscope (Tektronix 2445B or equivalent)
- Small mirror for adjustment :   J-6080-029-A
- Cleaning cloth :   3-184-527-01
- Cleaning fluid :   9-919-573-01
- REMOTE CONTROL UNIT (SVRM-100A, DSRM-10 or equivalent)
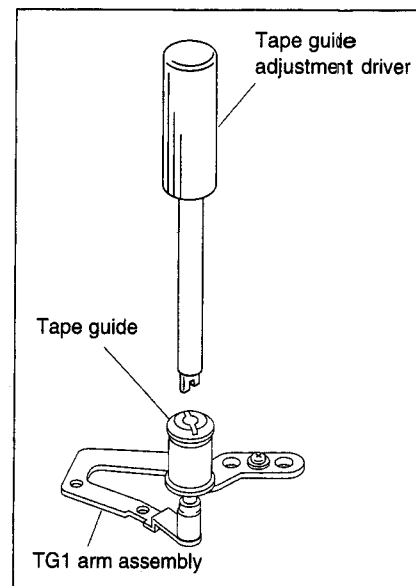
Preparation of Tape Path Adjustment

1. Cassette compartment assembly
It is not necessary to remove the cassette compartment assembly during tape path adjustment.

2. Cleaning the tape running surface
Clean the tape running surface of tape guides, head drum and video heads using the cleaning cloth moistened with cleaning fluid.
- Cleaning cloth :   3-184-527-01
- Cleaning fluid :   9-919-573-01

### 3. Information to use the tracking alignment tape (XH2-1AST)

Check the following items before entering the tracking adjustment mode.
* How to enter the maintenance menu, refer to Section 5-2-2.
* How to exit the maintenance menu, refer to Section 5-2-3.

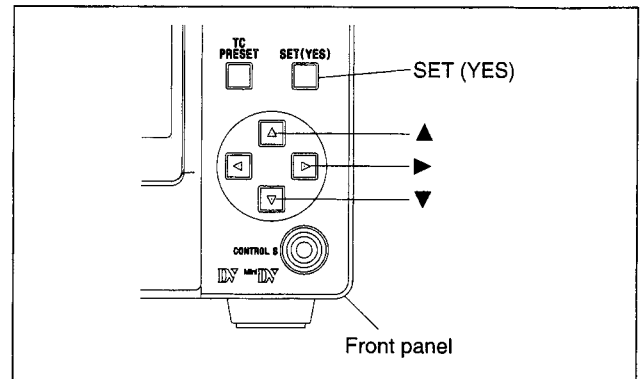### 4. Connecting the tape path adjustment tool

To adjust the tape path, use the tape path adjustment board (DJ-461), tape path tool connection cable (DJ-472), tape path tool power supply cable (DJ-500), and DC regulated power supply.

(1) Set the output of the DC regulated power supply to +12 Vdc/−12 Vdc.
(2) Insert the connector of the tape tape path tool connection cable (DJ-472) into the connector (CN4) of the path adjustment board (DJ-461).
(3) Insert another connector of the tape path tool connection cable (DJ-472) into CN3 on the RP-117 board.
(4) Insert the connector of the tape path tool connection cable (DJ-500) into the connector (CN2) of the tape path adjustment board (DJ-461).
(5) Connect the tape path tool power supply cable (DJ-500) to the DC regulated power supply.
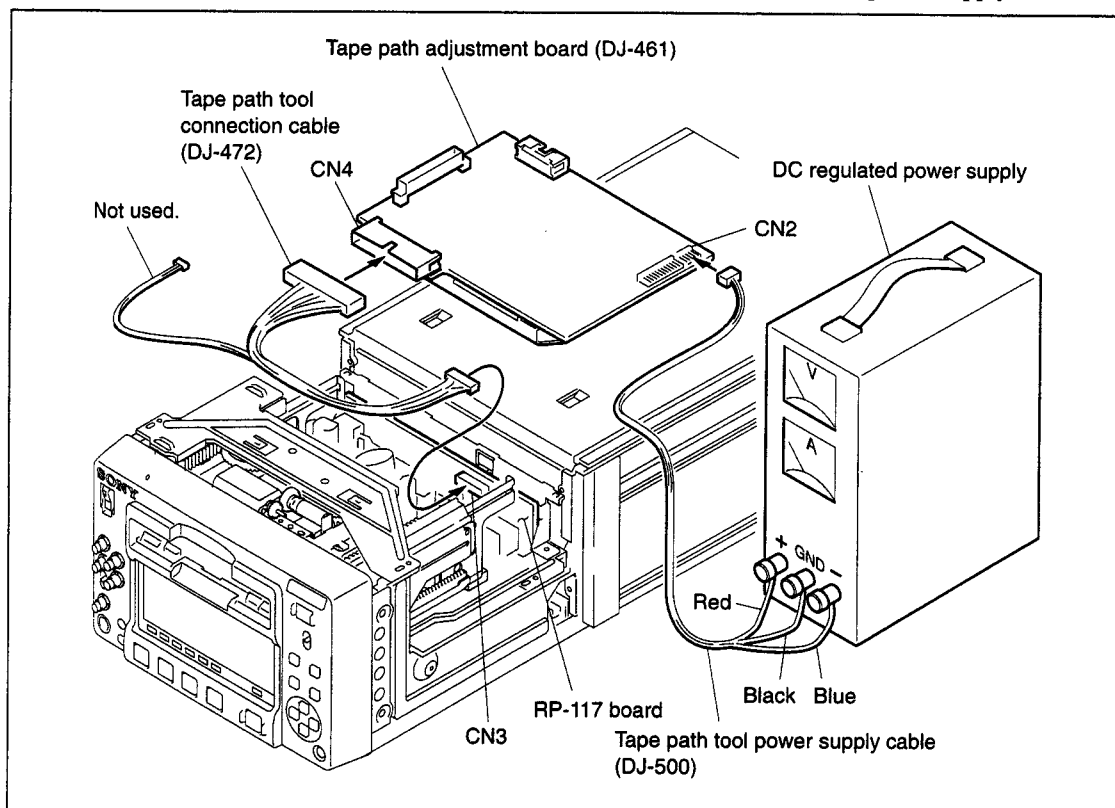
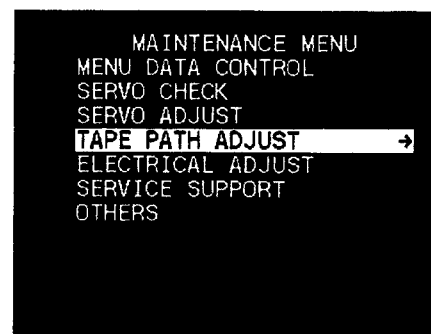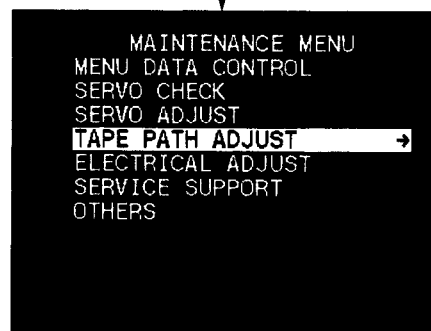## 5. Operating procedures of tracking adjustment

Use the keys of $\boxed{\blacktriangle}$, $\boxed{\blacktriangledown}$, $\boxed{\blacktriangleright}$ and $\boxed{\text{SET (YES)}}$ on the front panel to perform the tracking adjustment.

Front panel

(1) Enter the maintenance menu.

(2) Move the cursor to "TAPE PATH ADJUST" which is displayed with a white background using the $\boxed{\blacktriangle}$, $\boxed{\blacktriangledown}$ keys.


```
        MAINTENANCE MENU
MENU DATA CONTROL
SERVO CHECK
SERVO ADJUST
TAPE PATH ADJUST            →
ELECTRICAL ADJUST
SERVICE SUPPORT
OTHERS
```

(3) Press the $\boxed{\blacktriangleright}$ key.
This selects "TAPE PATH ADJUST" and menu of the lower level directory appears.


```
        MAINTENANCE MENU
MENU DATA CONTROL
SERVO CHECK
SERVO ADJUST
TAPE PATH ADJUST            →
ELECTRICAL ADJUST
SERVICE SUPPORT
OTHERS
```

(4) Move the cursor to "TRACKING ADJUST" which is displayed with a white background using the $\boxed{\blacktriangle}$, $\boxed{\blacktriangledown}$ keys.


```
        MAINTENANCE MENU
TAPE PATH ADJUST
    TRACKING ADJUST
RF SWITCHING POSITION
```
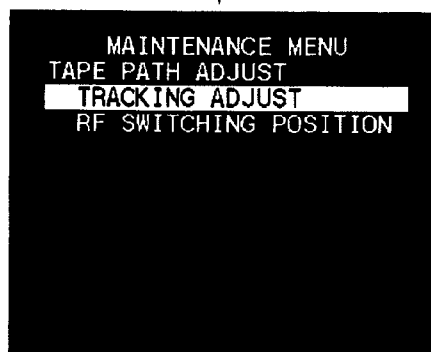
(5) Press the ▶ key to show the "START OK?" display.

```
 TAPE PATH ADJUST


    START OK ?

          OK  :   SET KEY
   TO MENU  :  MENU KEY
```

(6) Press the SET (YES) key.
(7) Display the "TRACKING ADJUST" on the screen.
    The adjustments that are described in sections 8-2, 8-4
    to 8-8 are performed under this mode.

| Note |

This unit does not have the tracking shift function. Instead
of having the tracking shift function, the tracking align-
ment tape XH2-1AST has already been recorded in the
factory so that the servo is locked at 50 % off-track
automatically.

```
     TAPE PATH ADJUST


     TRACKING ADJUST




   ADJUST MENU  :   (←) KEY
```

8-4

6. Tape guide locations

S3 (Tension regulator)   S2   S1   Head drum   T1   T2   Capstan   Pinch roller   T3

S4   T4

S reel   Standard cassette   M cassette   Mini cassette   T reel

7. Tape running condition

FWD

Capstan shaft

$\begin{pmatrix} \text{Tension} \\ \text{regulator} \end{pmatrix}$

S4   S3   S2   S1   Head drum   T1   T2   T3   T4

S reel   T reel

The hatched areas (marked by //////) are contacting with tape or pressing tape.
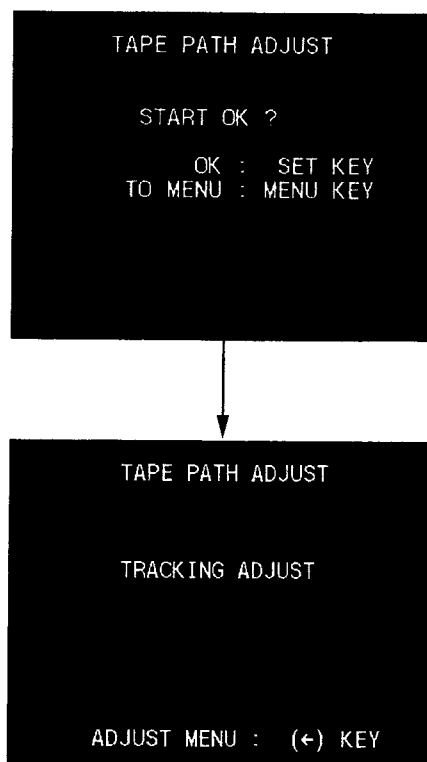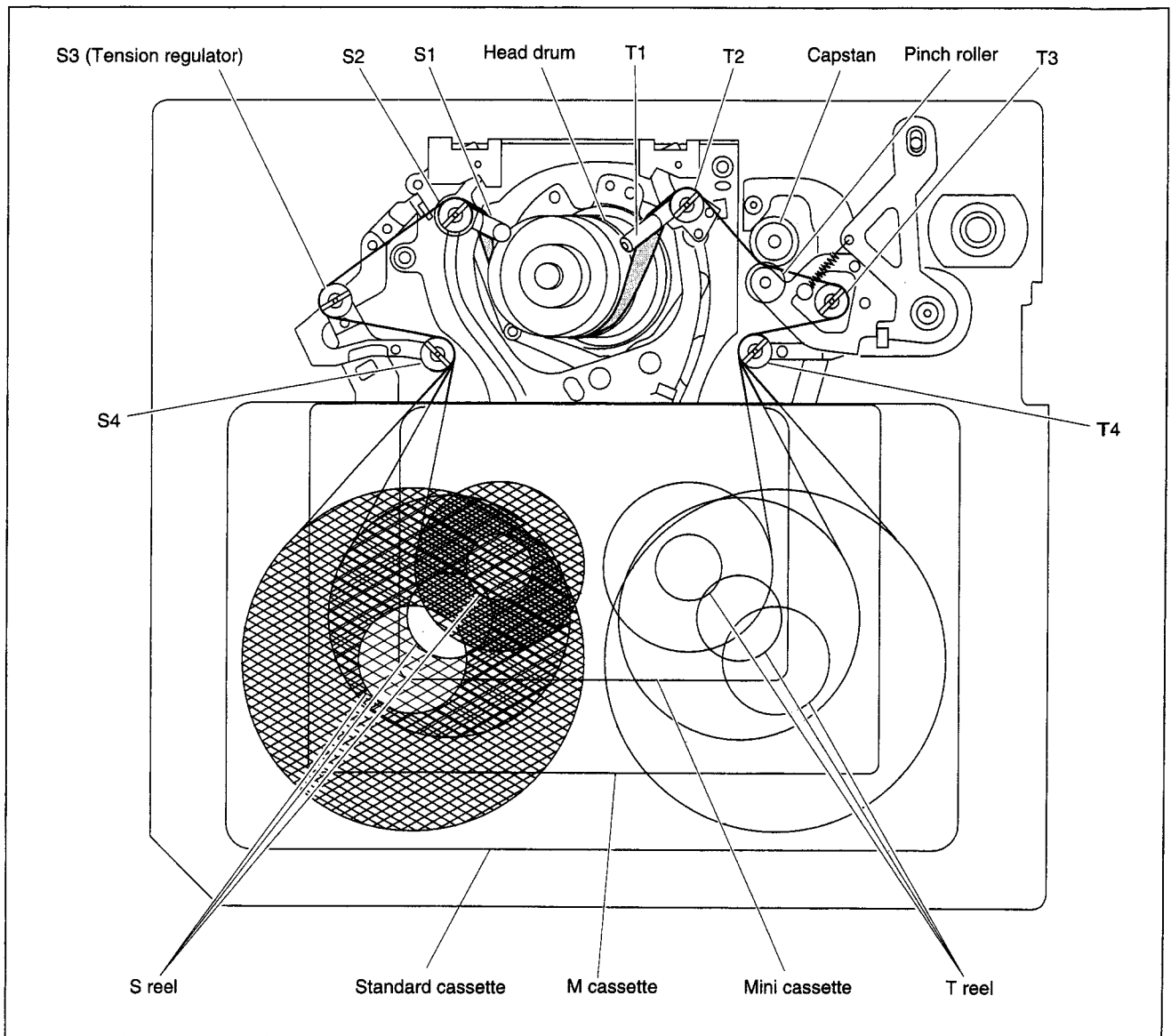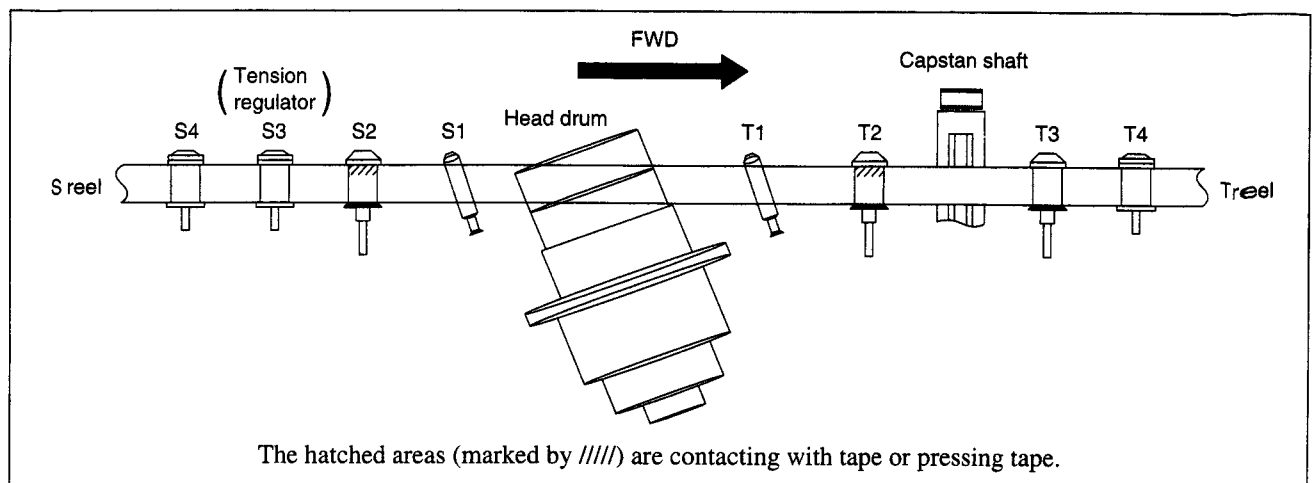
8. Switch setting of the tape path adjustment board (DJ-461)
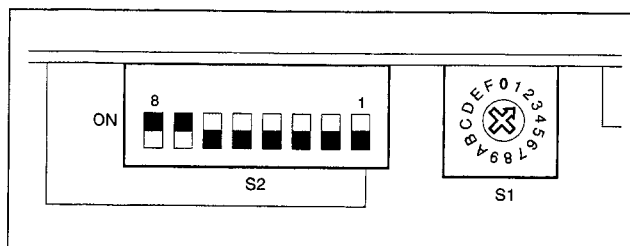
SW	Bit	Setting	Function
S1	–	2	Select the R/P head.
S2	1	OFF	
	2	OFF	
	3	OFF	
	4	OFF	
	5	OFF	
	6	OFF	
	7	ON	
	8	ON	Activate the switch setting of DJ-461

9. Measuring points/signal for adjustment

Signal name	Board	Measuring point
RF output (signal after envelope detection)	DJ-461	TP2
Switching pulse output	DJ-461	TP3
GND	DJ-461	E1
	DJ-461	E2

Tape path adjustment board, DJ-461
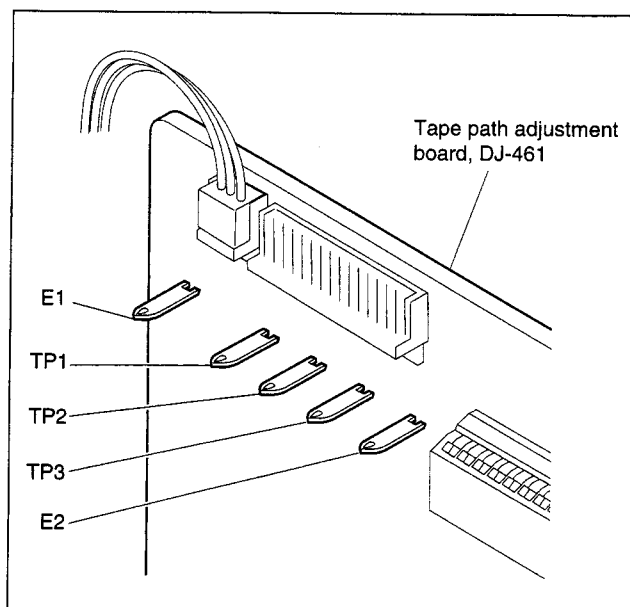
Note

HEAD	S1	SWITCHING
R/P E*1	[2]	H
R/P O	[2]	L

*1 : The head that is used for tape path adjustment when switches S2-7 and S2-8 on the path adjustment board (DJ-461) are ON.

8-2. Tape Path Adjustment

To perform the tracking adjustment using the alignment tape (XH2-1AST), refer the following items.
- For the procedure to enter the maintenance menu, refer to Section 5-2-2.
- For the procedure to exit the maintenance menu, refer to Section 5-2-3.
- For the operating procedure of the maintenance menu during the tracking adjustment, refer to Section 8-1.

Tools

- Alignment tape, XH2-1AST :   8-967-999-02
- Tape path adjustment board, DJ-461 :   J-6444-610-B
- Tape path tool connection cable, DJ-472 :   J-6444-720-A
- Tape path tool power supply cable, DJ-500 : J-6445-000-A
- DC regulated power supply
- Dual trace oscilloscope

Check Procedure

1. Connect the oscilloscope as follows :
   CH-1 : TP2 / DJ-461
   CH-2 : TP3 / DJ-461
   TRIG : CH-2
2. Insert the alignment tape XH2-1AST on the VTR.
3. Put the unit into PLAY mode.
4. Adjust the variable VOLTS/DIV control of the oscilloscope so that the maximum amplitude of the RF waveform becomes the three DIVISIONs on the oscilloscope.

Specification : max. − min. ≦ 4/5 Div

5. Adjust the RF waveform until it satisfies the specification by changing the height of the S2 and T2 guides.
   - When the RF waveform at the entrance side forms the shape of the solid line shown in Fig.1, turn the guide S2 clockwise to obtain the flat waveform.

   | Note |

   This adjustment must end with the clockwise rotation of the guide S2.

Specification : max. − min. ≦ 4/5 Div
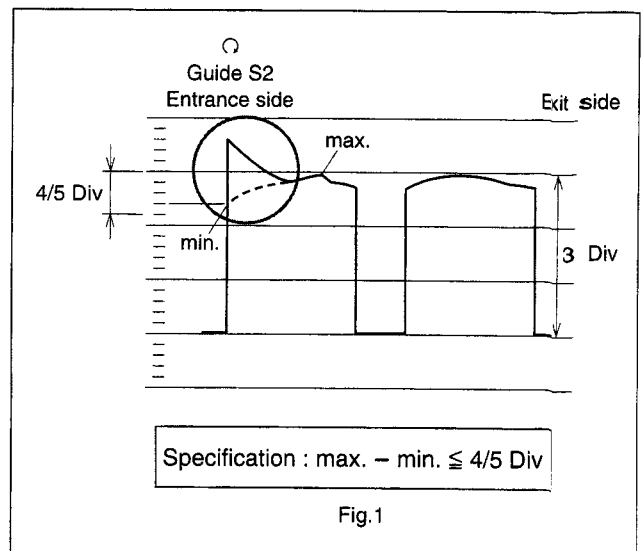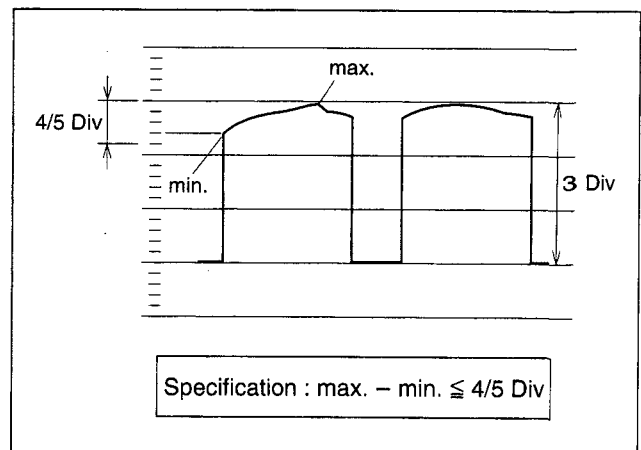
Fig.1

- When the RF waveform at the entrance side forms the shape of the solid line shown in Fig.2, turn the guide S2 counterclockwise to waveform as shown by the solid line in Fig.1. Then turn the guide S2 clockwise to obtain the desired waveform.

  | Note |

  This adjustment must end with the clockwise rotation of the guide S2.

Guide S2
Entrance side   Exit side

4/5 Div

max.

min.

3 Div

Specification : max. − min. ≦ 4/5 Div

Fig.2

- When the RF waveform at the exit side forms the shape of the solid line shown in Fig.3, turn the guide T2 clockwise to obtain the flat waveform.
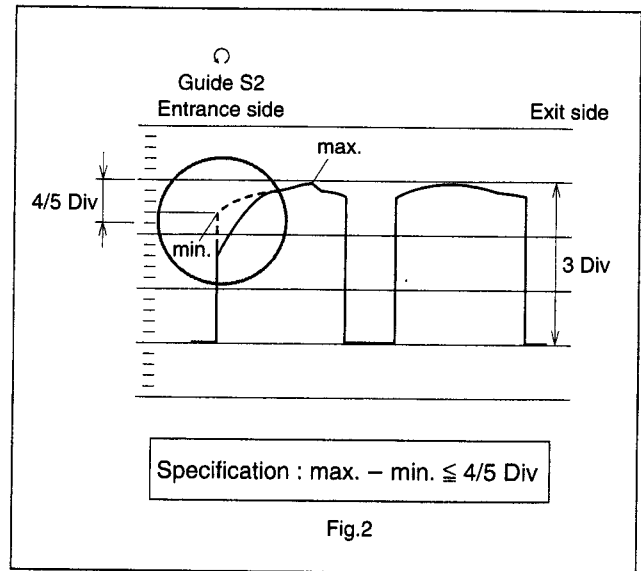
  | Note |

  This adjustment must end with the clockwise rotation of the guide T2.

Entrance
side

Guide T2
Exit side

4/5 Div

max.

min.

3 Div

Specification : max. − min. ≦ 4/5 Div

Fig.3

• When the RF waveform at the exit side forms the shape of the solid line shown in Fig.4, turn the guide T2 counterclockwise to waveform as shown by the solid line in Fig. 3. Then turn the guide T2 clockwise to obtain the desired waveform.
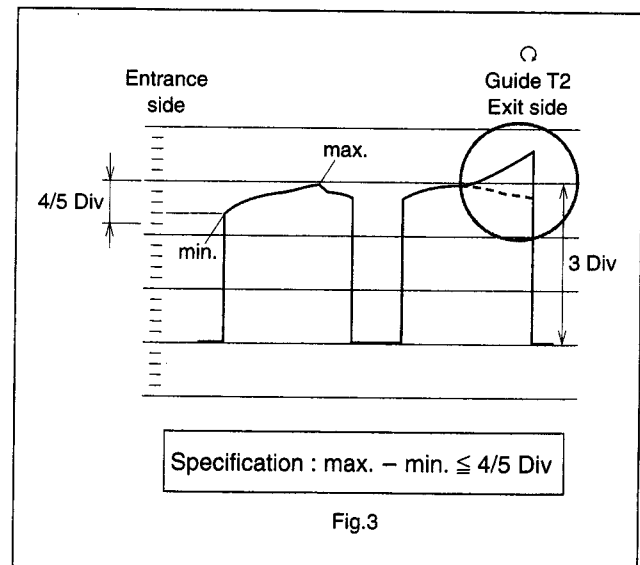
| Note |

This adjustment must end with the clockwise rotation of the guide T2.

Entrance side

Guide T2
Exit side

4/5 Div

max.

min.

3 Div

Specification : max. − min. ≦ 4/5 Div

Fig.4

6. Measure the minimum amplitude of the RF waveform, and confirm that the amplitude difference between the maximum and the minimum of the RF waveform satisfies the specification.

4/5 Div

max.

min.

3 Div

Specification : max. − min. ≦ 4/5 Div

8-3. RF Switching Position Adjustment

Be sure to perform the RF switching position adjustment whenever the tape path
adjustment (refer to Section 8-2) is performed.
Perform this adjustment in the AUTO mode.

To perform the RF switching position adjustment using the alignment tape (XH5-
1A2 for NTSC or XH5-1AP2 for PAL), refer the following items.
 • For the procedure to enter the maintenance menu, refer to Section 5-2-2.
 • For the procedure to exit the maintenance menu, refer to Section 5-2-3.

Tools

Alignment tape, XH5-1A2 :   8-967-999-22 (for NTSC)
                XH5-1AP2 : 8-967-999-26 (for PAL)

Adjustment procedure RF switching position adjustment using the [AUTO adjustment]

Use the keys of ▲, ▼, ► and SET (YES) on the
front panel to perform the tracking adjustment.
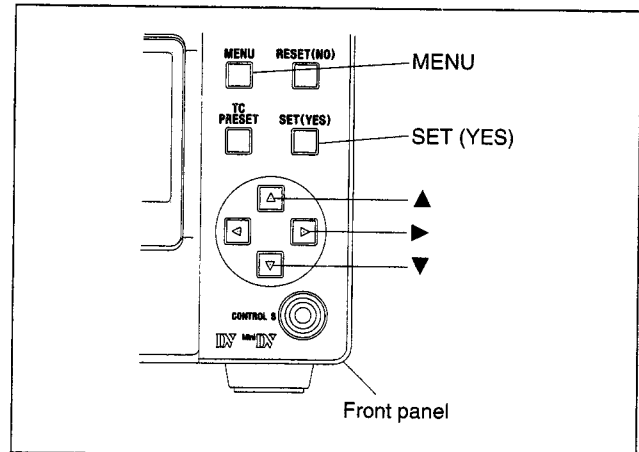
1. Enter the maintenance menu.
2. Move the cursor to "TAPE PATH ADJUST" which is
    displayed with a white background using the ▲, ▼
    keys.
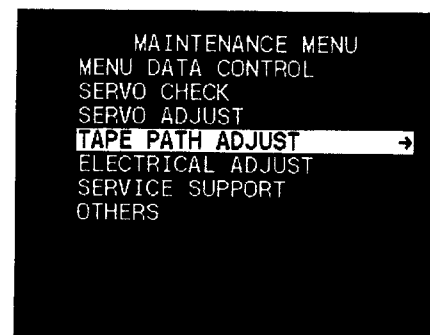
3. Press the ► key.
    "TAPE PATH ADJUST" is selected and its lower
    layer submenu appears.
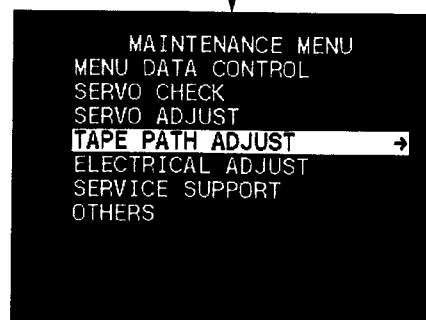
4. Move the cursor to "RF SWITCHING POSITION" which is displayed with a white background using the ▲, ▼ keys.

```
         MAINTENANCE MENU
      TAPE PATH ADJUST
         TRACKING ADJUST
    ← RF SWITCHING POSITION→
```

5. Select "START OK?" by pressing the ▶ key.

①
```
       TAPE PATH ADJUST


         START OK ?

            OK :  SET KEY
        TO MENU : MENU KEY
```

6. Press the SET (YES) key.

②
```
       SERVO ADJUST MODE

      RF SWITCHING POSITION
           AUTO ADJUST

    SET
    ALIGNMENT TAPE XH5-1A
    AND PUSH PLAY KEY.


        CANCEL : MENU KEY
```

7. Playback the alignment tape XH5-1A2 for NTSC or XH5-1AP2 for PAL. (display ②)
Then the unit starts the RF switching position automatic adjustment. (display ③)

③
```
       SERVO ADJUST MODE

      RF SWITCHING POSITION
           AUTO ADJUST

         NOW ADJUSTING ...



        CANCEL : MENU KEY
```

```
          ┌─────────────────────────────┐
          │      SERVO ADJUST MODE       │
          │    RF SWITCHING POSITION     │
    ④     │                             │
          │         NOW SAVING ...       │
          │                             │
          │                             │
          └─────────────────────────────┘
                         │
                         │
                         ▼
```
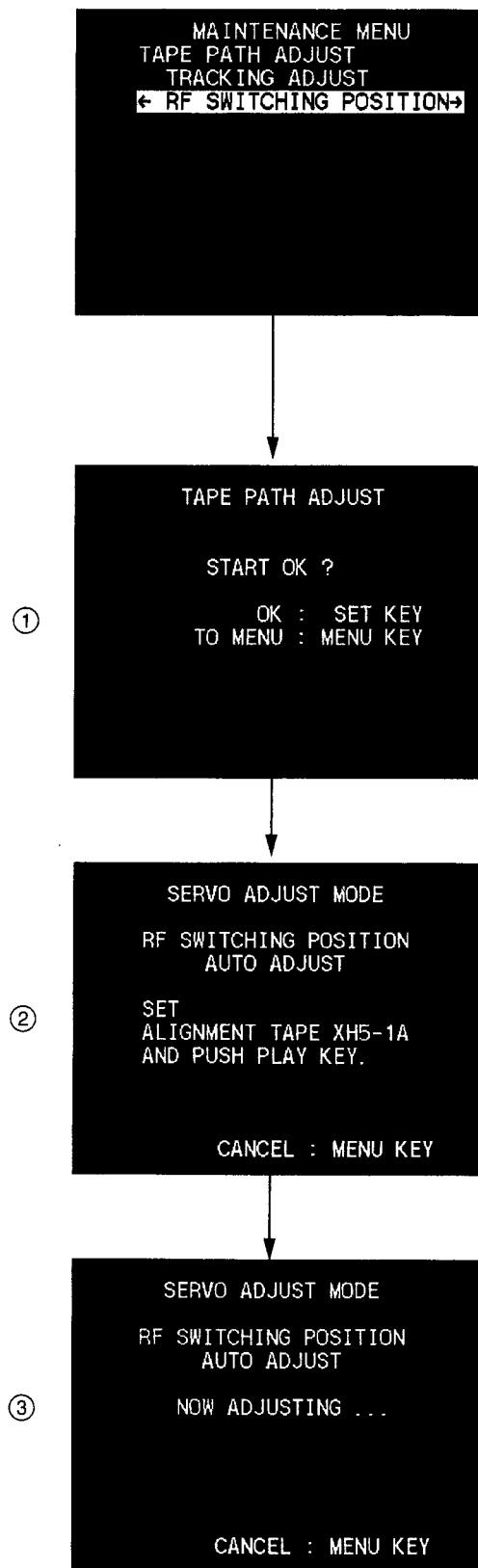
8. When the adjustment is completed, the display ⑤
    "COMPLETE" appears and alignment tape is automat-
    ically ejected.

    | Note |

    When the "ADJUST INCOMPLETE" appears on the
    monitor screen, check that the alignment tape which is
    played back is XH5-1A2 for NTSC, or XH5-1AP2 for
    PAL.

```
          ┌─────────────────────────────┐
          │      SERVO ADJUST MODE       │
          │    RF SWITCHING POSITION     │
    ⑤     │                             │
          │         COMPLETE             │
          │                             │
          │                             │
          │   ADJUST MENU :  (←) KEY     │
          └─────────────────────────────┘
```

9. Upon completion of adjustment the alignment tape is
    ejected automatically.
10. Press the | MENU | key to return to the maintenance
    menu.
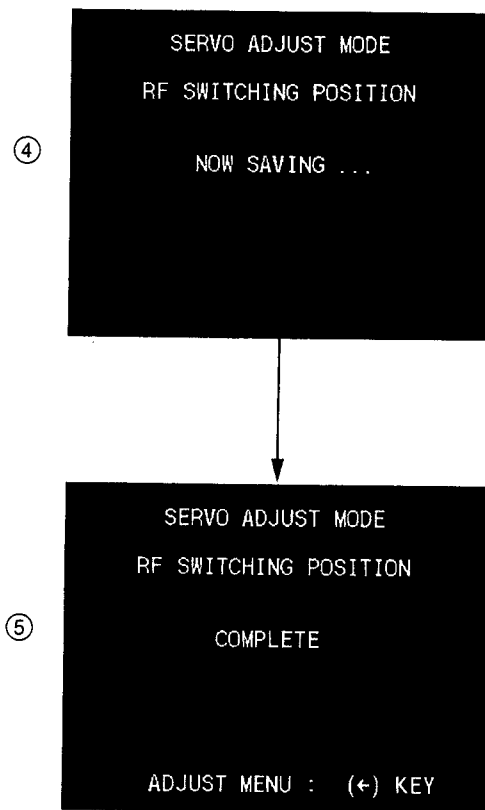
8-4. Tape Path Adjustment Confirmation

When Section 8-2, "Tape Path Adjustment" is completed, be sure to perform Section 8-3. "RF Switching Position Adjustment".

To perform tracking adjustment using the alignment tape (XH2-1AST), refer to the following items.
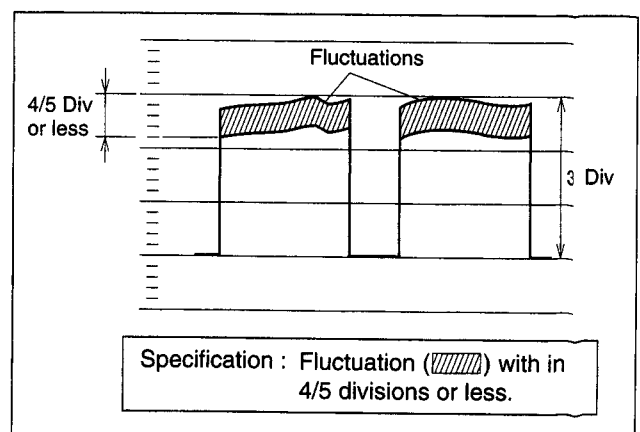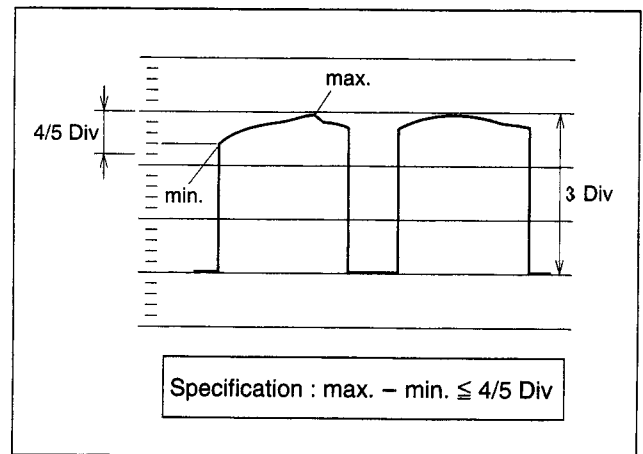- For the procedure to enter the maintenance menu, refer to Section 5-2-2.
- For the procedure to exit the maintenance menu, refer to Section 5-2-3.
- For the operating procedure of the maintenance menu during the tracking adjustment, refer to Section 8-1.

Tools

- Alignment tape, XH2-1AST :   8-967-999-02
- Tape path adjustment board, DJ-461 :   J-6444-610-B
- Tape path tool connection cable, DJ-472 :   J-6444-720-A
- Tape path tool power supply cable, DJ-500 : J-6445-000-A
- DC regulated power supply
- Dual trace oscilloscope

Check Procedure

1. Connect the oscilloscope as follows :
      CH-1 :   TP2/DJ-461
      CH-2 :   TP3/DJ-461
      TRIG :   CH-2
2. Insert the alignment tape XH2-1AST on the VTR.
3. Put the unit into PLAY mode.
4. Adjust the variable VOLTS/DIV control of the oscilloscope so that the maximum amplitude of the RF waveform becomes the three DIVISIONs on the oscilloscope.
5. Measure the minimum amplitude of the RF waveform, and confirm that the amplitude difference between the maximum and the minimum of the RF waveform satisfies the specification.

6. Confirm that fluctuation of the RF waveform satisfies the specification.

Specification : max. − min. ≤ 4/5 Div

Specification : Fluctuation (▨) with in 4/5 divisions or less.

8-5. Search Forward (×5) Waveform Check

Basic Knowledge

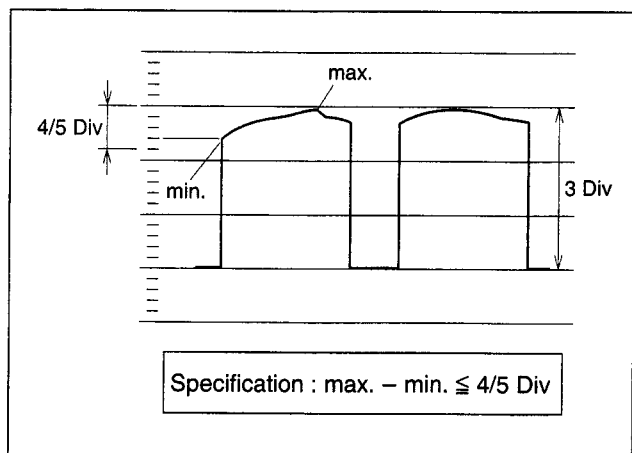To perform tracking adjustment using the alignment tape (XH2-1AST), refer to the following items.
* For the procedure to enter the maintenance menu, refer to Section 5-2-2.
* For the procedure to exit the maintenance menu, refer to Section 5-2-3.
* For the operating procedure of the maintenance menu during the tracking adjustment, refer to Section 8-1.

Tools

* Alignment tape, XH2-1AST :   8-967-999-02
* Tape path adjustment board, DJ-461 :   J-6444-610-B
* Tape path tool connection cable, DJ-472 :   J-6444-720-A
* Tape path tool power supply cable, DJ-500 : J-6445-000-A
* DC regulated power supply
* Dual trace oscilloscope
* REMOTE CONTROL UNIT

Check Procedure

1. Connect the oscilloscope as follows :
   CH-1 :   TP2/DJ-461
   CH-2 :   TP3/DJ-461
   TRIG :   CH-2
2. Insert the alignment tape XH2-1AST on the VTR.
3. Set the JOG dial on the remote control unit search FORWARD to the × 5 position.
4. Adjust the variable VOLTS/DIV control of the oscilloscope so that the maximum amplitude of the RF waveform becomes the three DIVISIONs on the oscilloscope.
5. Confirm that the RF waveform should be almost the same amplitude with constant intervals as shown in Fig.1.
6. Confirm that the RF waveform raises up within two seconds at the specified amplitude when the mode is changed from search FORWARD (× 5) to PLAY.

Fig.1

Specification : max. − min. ≦ 4/5 Div

8-6. Search Reverse (×5) Waveform Check

Basic Knowledge

To perform tracking adjustment using the alignment tape (XH2-1AST), refer to the following items.
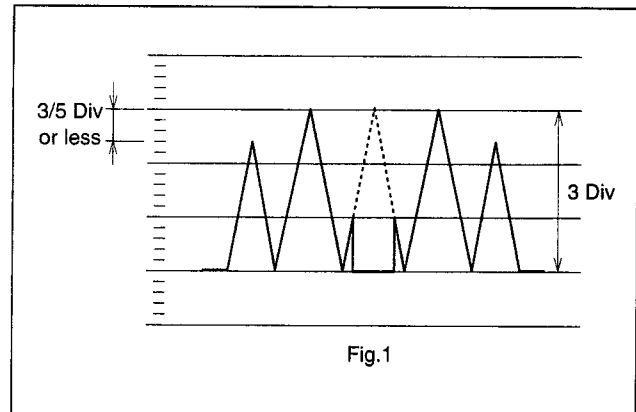- For the procedure to enter the maintenance menu, refer to Section 5-2-2.
- For the procedure to exit the maintenance menu, refer to Section 5-2-3.
- For the operating procedure of the maintenance menu during the tracking adjustment, refer to Section 8-1.

Tools

- Alignment tape, XH2-1AST :   8-967-999-02
- Tape path adjustment board, DJ-461 :   J-6444-610-B
- Tape path tool connection cable, DJ-472 :   J-6444-720-A
- Tape path tool power supply cable, DJ-500 : J-6445-000-A
- DC regulated power supply
- Dual trace oscilloscope
- REMOTE CONTROL UNIT

Check Procedure

1. Connect the oscilloscope as follows :
    CH-1 :   TP2/DJ-461
    CH-2 :   TP3/DJ-461
    TRIG :   CH-2
2. Insert the alignment tape XH2-1AST on the VTR.
3. Set the JOG dial on the remote control unit search REVERSE to the × 5 position.
4. Adjust the variable VOLTS/DIV control of the oscilloscope so that the maximum amplitude of the RF waveform becomes the three DIVISIONs on the oscilloscope.
5. Confirm that the RF waveform should be almost the same amplitude with constant intervals as shown in Fig.1.
6. Confirm that the RF waveform raises up within two seconds at the specified amplitude when the mode is changed from search REVERSE (× 5) to PLAY.

Fig.1

Specification : max. − min. ≤ 4/5 Div

8-7. RF Waveform Raiseup Check

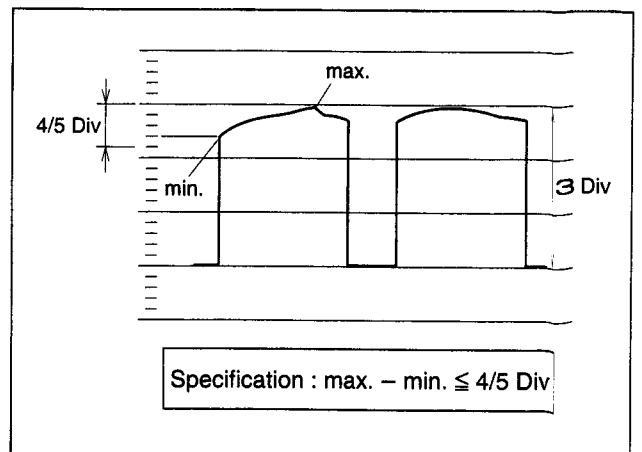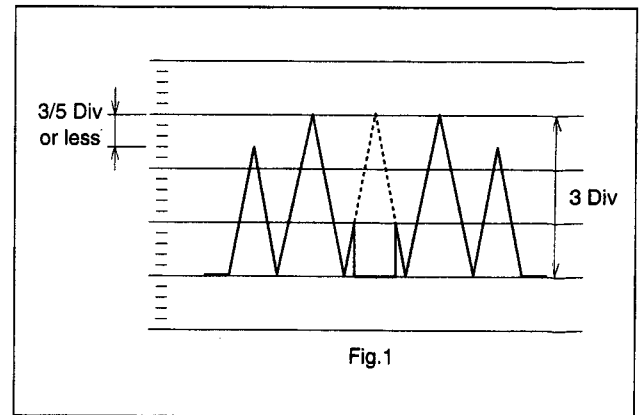To perform tracking adjustment using the alignment tape (XH2-1AST), refer to the following items.
- For the procedure to enter the maintenance menu, refer to Section 5-2-2.
- For the procedure to exit the maintenance menu, refer to Section 5-2-3.
- For the operating procedure of the maintenance menu during the tracking adjustment, refer to Section 8-1.

Tools

- Alignment tape, XH2-1AST :   8-967-999-02
- Tape path adjustment board, DJ-461 :   J-6444-610-B
- Tape path tool connection cable, DJ-472 :   J-6444-720-A
- Tape path tool power supply cable, DJ-500 : J-6445-000-A
- DC regulated power supply
- Dual trace oscilloscope

Check Procedure

1. Connect the oscilloscope as follows :
   CH-1 :   TP2 / DJ-461
   CH-2 :   TP3 / DJ-461
   TRIG :   CH-2
2. Insert the alignment tape XH2-1AST on the VTR.
3. Confirm that the RF waveform raises up within two seconds at the specified amplitude when the mode is changed from EJECT → PLAY → EJECT → PLAY repeatedly.
4. Confirm that the RF waveform raises up within two seconds at the specified amplitude when the mode is changed from FF → PLAY and from REW → PLAY.

Specification : max. − min. ≦ 4/5 Div
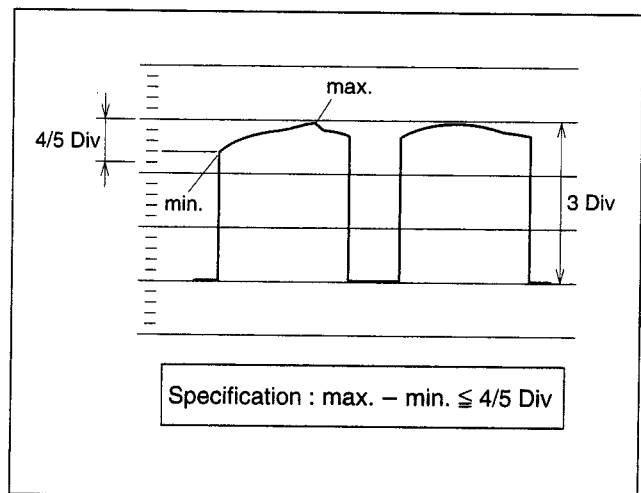
8-8. Tape Curl Check at Tape Guide
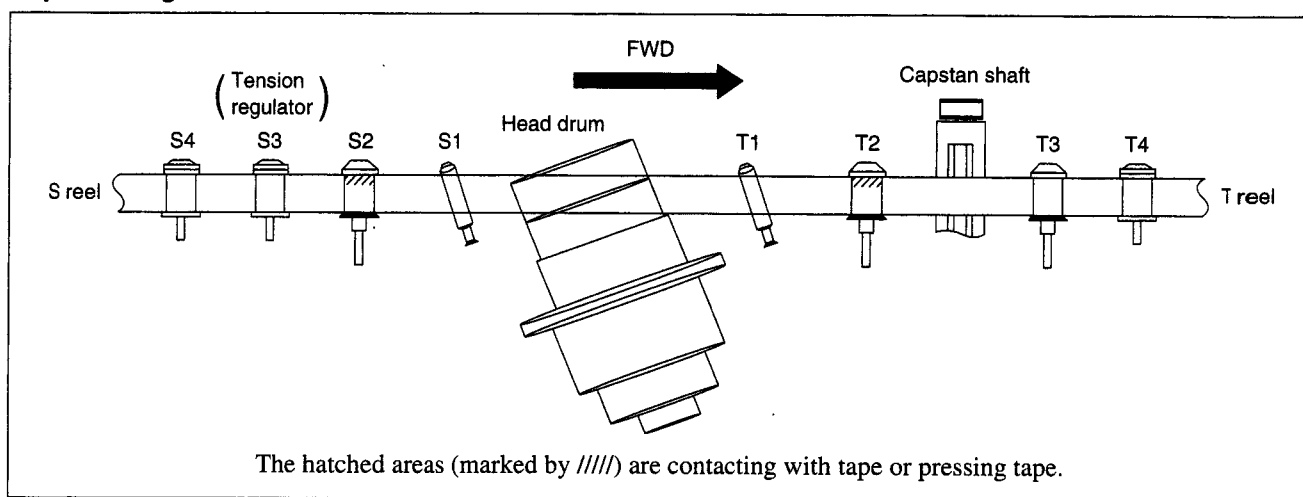
Tools

- Alignment tape, XH2-1AST :   8-967-999-02
- Dental mirror :   J-6080-029-A

Check Procedure

Confirm that tape runs at each tape guide as specified by the following figure when the unit put into the modes of PLAY, FF and REW respectively.

Tape running condition

The hatched areas (marked by //////) are contacting with tape or pressing tape.

Tape running condition

Tape guide	A (Contact with upper flange)	B (Runs in the center)	C (Contact with lower flange)	D (Curled)	E (Folded)	F (Dropped)
S4	O	O	O	X	X	X
S3	O	O	O	X	X	X
S2	O	X	X	X	X	X
T2	O	X	X	X	X	X
T3	O	O	O	X	X	X
T4	O	O	O	X	X	X

A : Contact with upper flange   B : Runs in center   C : Contact with lower flange   D : Curled   E : Folded   F : Dropped

Section 9
Adjustment When Replacing Board

9-1. Adjustment/Check Items When Replacing Board

No adjustment is required for the board other than below.

Board name	Setting/Adj. after replacement (Reference Section)	Contents
DR-428 board	5. Maintenance Menu	5-3-4. Servo Adjust S/T REEL & CAPSTAN Adjustment TENTION Adjustment 5-3-5. Tape Path Adjust TRACKING ADJUST Adjustment RF SWITCHING POSITION Adjustment
	6-2. Hours Meter	Reset the Hours Meter
	Operating Instructions Chapter 4. Menu	Resetting of Setup Menu Data
SSS-10 board	5. Maintenance Menu	5-3-1. Menu Data Control MENU/SW DATA SAVE/LOAD 5-3-4. Servo Adjust S/T REEL & CAPSTAN Adjustment TENTION Adjustment
RP-117 board	5. Maintenance Menu	5-3-6. Electrical Adjust PLL F0 Adjustment EQ (DVCAM) Adjustment EQ (DV) Adjustment EQ (DVCPRO) Adjustment

Section 10
Electrical Alignment

10-1. Electrical Alignment Overview

10-1-1. List of Adjustment Parts

* : The items with asterisk (*) require check only, and are not used normally.

10-1-2. Measuring Equipment and Tools

Type of measuring equipment	Equivalent	Remarks
Oscilloscope	Tektronix 2445	150 MHz or more
Video signal generator	TSG-130A (Op.03)	for NTSC
	TSG-131A (Op.03)	for PAL
Waveform monitor	Tektronix 1760 Op. SC/1765 Op. SC	
Audio signal generator	HP339A	
Audio level meter	HP3400A/MeguroMN-446	
Frequency counter	Advantest TR5821	
Extension board	DJ-495 (J-6444-950-A)	
Blank tape	DVM30ME, DVM30NME	On the market

10-1-3. Reference Tape for Alignment

XH5-1A2 (8-967-999-22) (for NTSC)

Recording contents are followings.

VIDEO	TIME CODE (h) (m) (s)	REC (s)	AUDIO		
Black Burst	23 : 59 : 00	60	No Signal		
75 % Full Color Bars	00 : 00	60	1 kHz		
60 % Multi Burst	01 : 00	60	20 Hz		
Bowtie with Mod 12.5T	02 : 00	30	14.5 kHz		
Shallow Ramp	02 : 30	30	10 kHz		
	03 : 00	30	No Signal		32 kHz
Cross Hatch (index)	03 : 30	30	1 kHz 0 dBFS		4 ch
Line 17	04 : 00	40	1 ch		
75 % Full Color Bars	04 : 40	40	2 ch	1 kHz	
Quad Phase	05 : 20	40	3 ch		
	06 : 00	40	4 ch		
Black Burst	06 : 40	5	No Signal		
	06 : 45	5			
60 % Multi Burst (for Composite)	06 : 50	60	1 kHz		
Mod 12.5T	07 : 50	30	20 Hz		
Shallow Ramp (B-Y/R-Y OFF)	08 : 20	30	20 kHz		
	08 : 50	30	10 kHz		
Cross Hatch (index)	09 : 20	30	1 kHz 0 dBFS		
Chroma Noise	09 : 50	30			
Line 17	10 : 20	30			
75 % Full Color Bars	10 : 50	180			48 kHz
60 % Multi Burst	13 : 50	60			2 ch
Mod 12.5T	14 : 50	30			
Shallow Ramp	15 : 20	60	1 kHz		
75 % Full Color Bars	16 : 20	100			
75 % Full Color Bars (R-Y OFF)	18 : 00	180			
75 % Full Color Bars (B-Y OFF)	21 : 00	180			
Blanking Marker	24 : 00	180			
Line 17 (R-Y OFF)	27 : 00	180			
Line 17 (B-Y OFF)	30 : 00	180			

∗ Audio levels are −20 dBFS (Reference), except 1 kHz 0 dBFS part.

XH5-1AP2 (8-967-999-26) (for PAL)

Recording contents are followings.

VIDEO	TIME CODE (h) (m) (s)	REC (s)	AUDIO			
Black Burst	23 : 59 : 00	60	No Signal			
100 % Full Color Bars	00 : 00	60	1 kHz			
60 % Multi Burst	01 : 00	60	20 Hz			
Bowtie with Mod 10T	02 : 00	30	14.5 kHz			
Shallow Ramp	02 : 30	30	10 kHz		32 kHz	
	03 : 00	30	No Signal		4 ch	
Cross Hatch (index)	03 : 30	30	1 kHz 0 dBFS			
Line 17	04 : 00	40	1 ch			
100 % Full Color Bars	04 : 40	40	2 ch	1 kHz		
Quad Phase	05 : 20	40	3 ch			
	06 : 00	40	4 ch			
Black Burst	06 : 40	5	No Signal			
	06 : 45	5				
60 % Multi Burst (for Composite)	06 : 50	60	1 kHz			
Mod 10T	07 : 50	30	20 Hz			
Shallow Ramp (B-Y/R-Y OFF)	08 : 20	30	20 kHz			
	08 : 50	30	10 kHz			
Cross Hatch (index)	09 : 20	30	1 kHz 0 dBFS			
Chroma Noise	09 : 50	30				
Line 17	10 : 20	30				
100 % Full Color Bars	10 : 50	180			48 kHz	
60 % Multi Burst	13 : 50	60			2 ch	
Mod 10T	14 : 50	30				
Shallow Ramp	15 : 20	60	1 kHz			
100 % Full Color Bars	16 : 20	100				
100 % Full Color Bars (R-Y OFF)	18 : 00	180				
100 % Full Color Bars (B-Y OFF)	21 : 00	180				
Blanking Marker	24 : 00	180				
Line 17 (R-Y OFF)	27 : 00	180				
Line 17 (B-Y OFF)	30 : 00	180				

* Audio levels are −18 dBFS (Reference), except 1 kHz 0 dBFS part.

10-2. Audio Adjustment

10-2-1. Audio OUTPUT Level Adjustment

Conditions for adjustment	Specification	Adjustment

• MENU
  ENHANCED
     ↓
  AU REF LEVEL ; −20 dB (for NTSC)
                −18 dB (for PAL)
  OUTPUT LEVEL ; +4 dB
  VIDEO INPUT SELECT ; SG
  AUDIO INPUT SELECT ; SG
• VAR (REC/PB)/Front panel ; PRESET
• INT AUDIO SG ; 1 kHz SINE
• EE mode
  TAPE ; EJECT
	AUDIO OUTPUT 1/3 & 2/4 (600 Ω loaded)
	
	Spec. : +4.0 ±0.1 dBm
		CH-1 ;
		⊘RV601/AVP-3/3P (D-7)
		CH-2 ;
		⊘RV602/AVP-3/3P (D-7)

10-2-2. Audio EE Level Adjustment

Conditions for adjustment	Specification	Adjustment

• MENU
  ENHANCED
     ↓
  AU REF LEVEL ; −20 dB (for NTSC)
                −18 dB (for PAL)
  OUTPUT LEVEL ; +4 dB
  VIDEO INPUT SELECT ; SG
  AUDIO INPUT SELECT ; ANALOG
• VAR (REC/PB)/Front panel ; PRESET
• AUDIO INPUT CH-1/CH-2 ;
  1 kHz, +4 dBu
• EE mode
  TAPE ; EJECT
	AUDIO OUTPUT 1/3 & 2/4 (600 Ω loaded)
	
	Spec. : +4.0 ±0.3 dBm
		CH-1 ;
		⊘RV700/DDE-15/15P
		  (D-6)
		CH-2 ;
		⊘RV701/DDE-15/15P
		  (D-7)

10-3. Video Adjustment

Setting the Switches and SETUP MENU
This setting should be fixed in position unless otherwise specified.

For NTSC
Switch

LOCAL/REMOTE	; LOCAL

SETUP MENU

CHARA.DISPLAY	; ON	PROCESS CONTROL	; LOCAL
		VIDEO GAIN	
SETUP REMOVE	; OFF	CHROMA GAIN	; PRESET
SETUP ADD	; OFF	CHROMA PHASE	
		SETUP LEVEL	

For PAL
Switch

LOCAL/REMOTE	; LOCAL

SETUP MENU

CHARA.DISPLAY	; ON	VIDEO GAIN	
		CHROMA GAIN	; PRESET
PROCESS CONTROL	; LOCAL	CHROMA PHASE	
		BLACK LEVEL	

Connection
Connect some equipment as following unless otherwise specified.

(Connection 1)

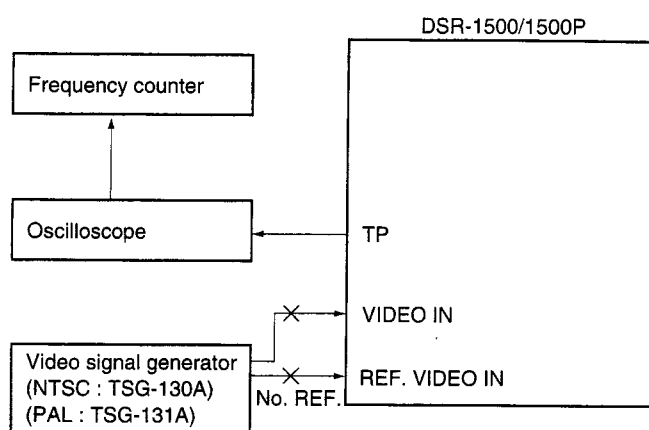DSR-1500/1500P

Oscilloscope ← TP

COMPONENT IN

Video signal generator
(NTSC : TSG-130A)
(PAL : TSG-131A)   BB

REF. VIDEO IN
(75 Ω : OFF)   COMPONENT OUT → ⌈ CH-1
                                  ⌊ CH-2
                                    CH-3

EXT REF

WFM or Oscilloscope
(Terminated at 75 Ω)

(Connection 2)

DSR-1500/1500P

Oscilloscope ← TP

⌈ VIDEO IN (75 Ω : ON)
⌊ S VIDEO IN

Video signal genelator
(NTSC : TSG-130A)
(PAL : TSG-131A)   BB

REF. VIDEO IN
(75 Ω : OFF)

(VIDEO OUT 3)
(VIDEO OUT 2)
REF.VIDEO OUT
S VIDEO OUT
VIDEO OUT 1

WFM

A

EXT REF

10-3-1. INT SC Frequency Adjustment

Conditions for adjustment	Specification	Adjustment
Oscilloscope or voltmeter • STOP mode	① Measure the voltage (Vo) at the TP504/ AVP-3/3P (E-1). ② Measure the voltage at the TP502/ AVP-3/3P (E-1).	❷RV501/AVP-3/3P (E-1)
Connection 1	Spec. : V = Vo ±0.1 Vdc	
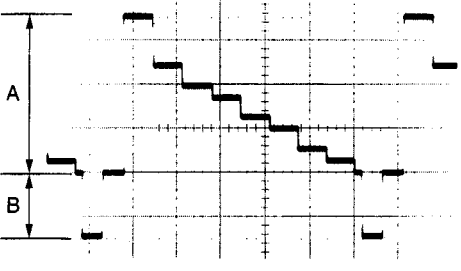
10-3-2. HCK Frequency Adjustment

(Connection)

DSR-1500/1500P

```
┌──────────────────┐        ┌─────────────────────────┐
│ Frequency counter │        │                         │
└──────────────────┘        │                         │
         ▲                  │                         │
         │                  │                         │
┌──────────────────┐        │                         │
│ Oscilloscope     │◄───────┤ TP                      │
└──────────────────┘        │                         │
                     ──╳──► │ VIDEO IN                │
┌──────────────────┐        │                         │
│ Video signal     │───╳──► │ REF. VIDEO IN           │
│ generator        │ No. REF.                         │
│ (NTSC : TSG-130A)│        └─────────────────────────┘
│ (PAL : TSG-131A) │
└──────────────────┘
```
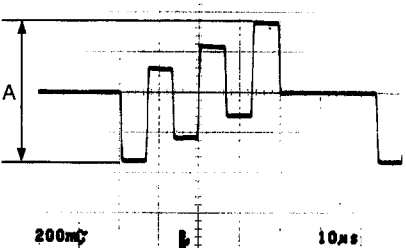
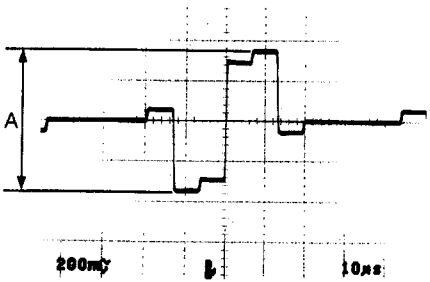| Conditions for adjustment	Specification	Adjustment
Frequency counter • STOP mode • REF. VIDEO IN ; No signal • VIDEO IN Select ; Composite • VIDEO IN ; No signal	TP500/AVP-3/3P (E-1) Spec. : f = 13,500,000 ±35 Hz	❷RV500/AVP-3/3P (E-1)

10-3-3. COMPONENT Y OUT Level Adjustment

Conditions for adjustment	Specification	Adjustment

[For NTSC]
WFM or Oscilloscope
• MENU SETUP ADD ; ON
• PB mode
  75 % Color bars/XH5-1A2
• VIDEO OUT select/MENU ; Y-R, B
 	
[For PAL]
WFM or Oscilloscope
• PB mode
  100 % Color bars/XH5-1AP2
 	
Connection 1
	COMPONENT Y OUT (75 Ω terminated)
	
	(A) Y/S-Y Level
	(B) Y/S-Y SYNC
	
	TRIG : REF. VIDEO
	
	Spec. :
	[For NTSC]
	    A = 0.714 ±0.007 V (100 ±1 IRE)
	    B = 0.286 ±0.003 V (40 ±0.5 IRE)
	[For PAL]
	    A = 0.700 ±0.007 V
	    B = 0.300 ±0.003 V
		⊘RV300/AVP-3/3P (B-3)
		⊘RV307/AVP-3/3P (B-2)
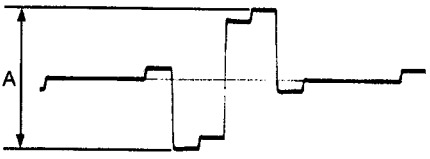
10-3-4. COMPONENT B-Y OUT Level Adjustment

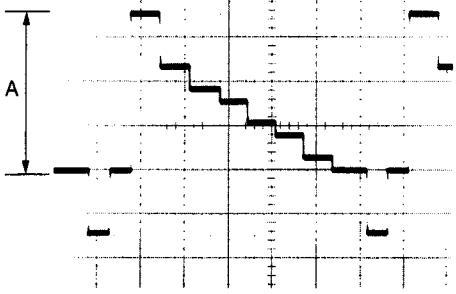| Conditions for adjustment	Specification	Adjustment

[For NTSC]
WFM or Oscilloscope
• MENU SETUP ADD ; ON
• PB mode
  75 % Color bars/XH5-1A2
• VIDEO OUT select/MENU ; Y-R, B
 	
[For PAL]
WFM or Oscilloscope
• PB mode
  100 % Color bars/XH5-1AP2
 	
Connection 1
	COMPONENT B-Y OUT (75 Ω terminated)
	
	TRIG : REF. VIDEO
	
	200mᵥ 10µs
	
	Spec. :
	[For NTSC]
	    A = 0.700 ±0.007 V (98 ±1 IRE)
	[For PAL]
	    A = 0.700 ±0.070 V
		⊘RV104/AVP-3/3P (D-4)

10-3-5. COMPONENT R-Y OUT Level Adjustment

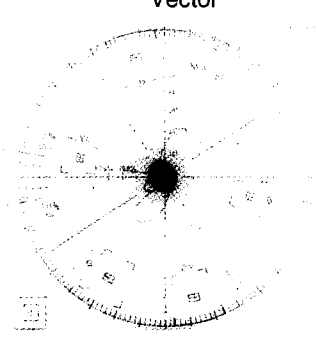| Conditions for adjustment	Specification	Adjustment

[For NTSC]
WFM or Oscilloscope
· MENU SETUP ADD ; ON
· PB mode
  75 % Color bars/XH5-1A2
· VIDEO OUT select/MENU ; Y-R, B
 	
[For PAL]
WFM or Oscilloscope
· PB mode
  100 % Color bars/XH5-1AP2
 	
Connection 1
	COMPONENT R-Y OUT (75 Ω terminated)
	
	TRIG : REF. VIDEO
	
	A
	
	200mv 10µs
	
	Spec. :
	[For NTSC]
	     A = 0.700 ±0.007 V p-p (98 ±1 IRE)
	[For PAL]
	     A = 0.700 ± 0.007 V p-p
		✪RV106/AVP-3/3P (D-5)

10-3-6. SETUP OFF Chroma Level Check (NTSC only)
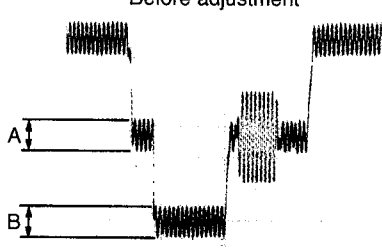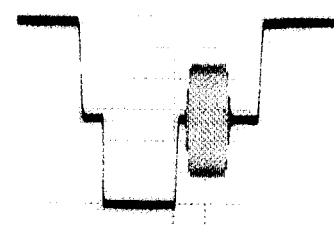
Conditions for adjustment	Specification	Adjustment
WFM or Oscilloscope · PB mode 75 % Color bars/XH5-1A2 · VIDEO OUT select/MENU ; Y-R, B [Note] Check that MENU SETUP ADD ; OFF Connection 1	COMPONENT R-Y OUT (75 Ω terminated) TRIG : REF. VIDEO A Spec. : A = 0.757 ±0.007 V p-p (106 ±1 IRE)	

10-3-7. S VIDEO OUT Y Level Check

Conditions for adjustment	Specification	Adjustment
WFM or Oscilloscope • PB mode 　75 % Color bars/XH5-1A2 (for NTSC) 　100 % Color bars/XH5-1AP2 (for PAL) • VIDEO OUT select/MENU ; S-VIDEO Connection 2	S VIDEO (Y) OUT (75 Ω terminated) TRIG : REF. VIDEO Spec. : [For NTSC] 　　A = 0.714 ±0.007 V (100 ±1 IRE) [For PAL] 　　A = 0.700 ±0.007 V	
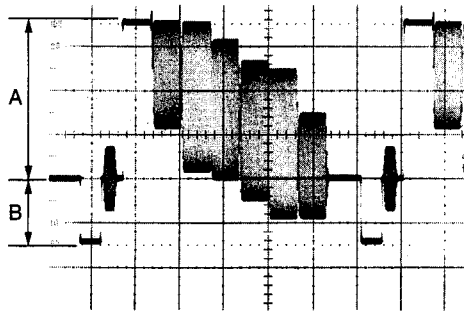
10-3-8. ENC SC Leak Adjustment
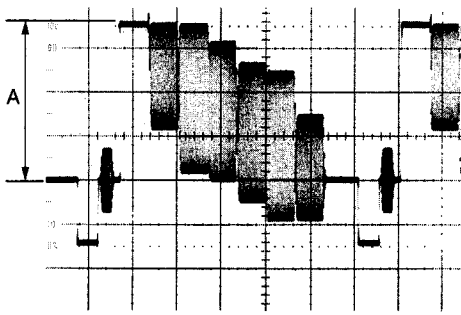
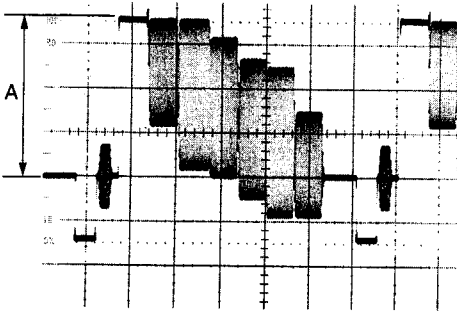| Conditions for adjustment	Specification	Adjustment

Step 1
• PB mode
  75 % Color bars/XH5-1A2 (for NTSC)
  100 % Color bars/XH5-1AP2 (for PAL)
• Set the time axis of the WFM to magnification mode
• VIDEO OUT select/MENU ; COMPOSITE
 	
Connection 2
	VIDEO OUT 1 (75 Ω terminated)
	
	(A) V SC Leak
	(B) U SC Leak
	
	TRIG : REF. VIDEO
	
	WFM
	
	Before adjustment
	
	A
	
	B
	
	(Spec. Adjust the A and B alternately.)
	⇩
	After adjustment
	
	Spec. : A, B ≦ 0.007 V (1 IRE)
		❷RV202/AVP-3/3P (C-5)
		❷RV203/AVP-3/3P (C-5)

Step 2 (Check)
• PB mode
  75 % Color bars/XH5-1A2 (for NTSC)
  100 % Color bars/XH5-1AP2 (for PAL)
• VIDEO OUT select/MENU ; COMPOSITE
 	
Connection 2
	VIDEO OUT 1 (75 Ω terminated)
	
	TRIG : REF. VIDEO
	
	Vector
	
	Spec. : Maximum the gain of the Vector and
	check the dot is at center.	

10-3-9. VIDEO OUT 1 Video/Sync Level Adjustment

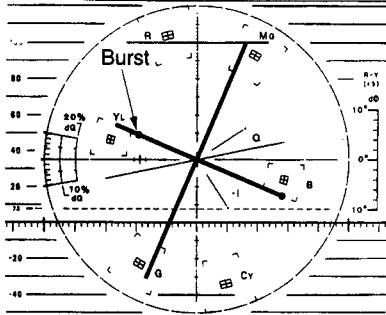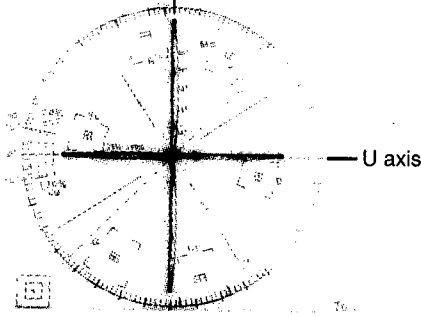| Conditions for adjustment	Specification	Adjustment

WFM or Oscilloscope
• PB mode
  75 % Color bars/XH5-1A2 (for NTSC)
  100 % Color bars/XH5-1AP2 (for PAL)
• VIDEO OUT select/MENU ; COMPOSITE
 	
Connection 2
	VIDEO OUT 1 (75 Ω terminated)
	
	(A) Video Level
	(B) Sync Level
	
	TRIG : REF. VIDEO
	
	Spec. :
	[For NTSC]
	        A = 0.714 ±0.007 V (100 ±1 IRE)
	        B = 0.286 ±0.003 V (40 ±0.5 IRE)
	[For PAL]
	        A = 0.700 ±0.007 V
	        B = 0.300 ±0.003 V
		⊘RV304/AVP-3/3P (B-3)
		⊘RV306/AVP-3/3P (B-3)

10-3-10. VIDEO OUT 2 Video Level Check

Conditions for adjustment	Specification	Adjustment

WFM or Oscilloscope
• PB mode
  75 % Color bars/XH5-1A2 (for NTSC)
  100 % Color bars/XH5-1AP2 (for PAL)
• VIDEO OUT select/MENU ; COMPOSITE
 	
Connection 2
	VIDEO OUT 2 (75 Ω terminated)
	
	TRIG : REF. VIDEO
	
	Spec. :
	[For NTSC]
	        A = 0.714 ±0.007 V (100 ±1 IRE)
	[For PAL]
	        A = 0.700 ±0.007 V	

10-3-11. VIDEO OUT 3 Y Level Adjustment

Conditions for adjustment	Specification	Adjustment

WFM or Oscilloscope
• PB mode
 75 % Color bars/XH5-1A2 (for NTSC)
 100 % Color bars/XH5-1AP2 (for PAL)
• VIDEO OUT select/MENU ; COMPOSITE
 	
Connection 2
	VIDEO OUT 3 (75 Ω terminated)
	
	TRIG : REF. VIDEO
	
	Spec. :
	[For NTSC]
	  A = 0.714 ±0.007 V (100 ±1 IRE)
	[For PAL]
	  A = 0.700 ±0.007 V
		❷RV305/AVP-3/3P (B-4)
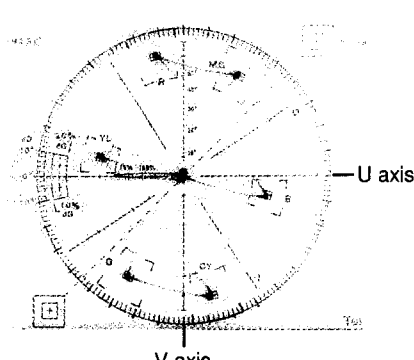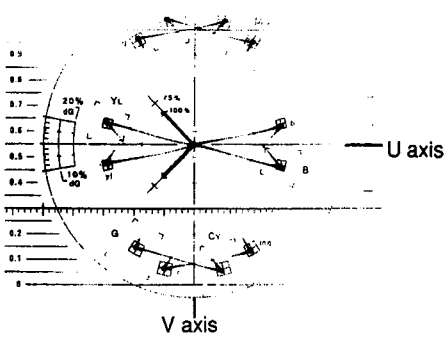
10-3-12. U-V Axis (B-Y, R-Y) Phase Adjustment
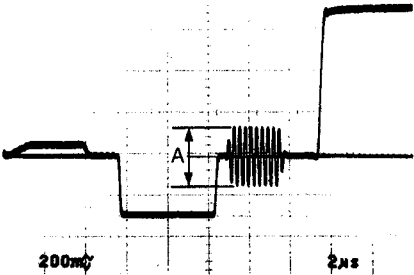
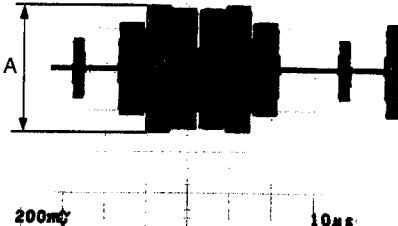| Conditions for adjustment	Specification	Adjustment
• PB mode • VIDEO OUT select/MENU ; COMPOSITE [Flow] (A) Burst preset • PB mode Quad Phase/XH5-1A2 or XH5-1AP2 (05:20-06:00) (B) V-axis phase adjustment • PB mode Quad Phase/XH5-1A2 or XH5-1AP2 (05:20-06:00) Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) Burst preset (B) V-axis (U/V OFFSET) TRIG : REF. VIDEO Vector (Before adjustment) ⇩ (After adjustment) Spec. : (A) Set the dot of the burst in the right position on the scale. (B) Set the dots of the R-Y on the V axis of the vector. C = 0 ±0.5 °	⦿PHASE control/Vector ⦿RV401/AVP-3/3P (D-2)

10-3-13. PB VIDEO OUT 1 Chroma/Burst Level Adjustment

Conditions for adjustment	Specification	Adjustment

WFM or Oscilloscope
• PB mode
  75 % Color bars/XH5-1A2 (for NTSC)
  100 % Color bars/XH5-1AP2 (for PAL)
• VIDEO OUT select/MENU ; COMPOSITE
 	
Note
The "Setup ON/OFF" setting of the DSR-1500/1500P and that a vectorscope must have been set to the same position beforehand.
 	
Connection 2
	VIDEO OUT 1 (75 Ω terminated)
	 Step 1 Chroma Level
	
	(A) Burst preset
	
	(B) ENC R-Y LEVEL
	    ENC B-Y LEVEL
	
	    TRIG : REF. VIDEO
	
	Vector (for NTSC)
	
	Vector (for PAL)
	
	Spec. : (A) Set the dot of the burst in the right
	             position on the scale.
	          (B) All dots should be inside the "⊞"
	             mark on the vector.
		⦸PHASE control/Vector
		⦸RV200/AVP-3/3P (C-5)
		⦸RV201/AVP-3/3P (C-5)

Conditions for adjustment	Specification	Adjustment

WFM or Oscilloscope
• PB mode
  75 % Color bars/XH5-1A2 (for NTSC)
  100 % Color bars/XH5-1AP2 (for PAL)
 	
Note
The "Setup ON/OFF" setting of the DSR-1500/1500P and that a vectorscope must have been set to the same position beforehand.
 	
Connection 2
	Step 2 Burst Level
	
	TRIG : REF. VIDEO
	
	Spec. :
	[For NTSC]
	        A = 0.286 ±0.003 V (40 ±0.5 IRE)
	[For PAL]
	        A = 0.300 ±0.003 V
		❷RV204/AVP-3/3P (C-4)

10-3-14. PB S VIDEO Chroma Level Adjustment

Conditions for adjustment	Specification	Adjustment

WFM or Oscilloscope
• MENU SETUP ADD ; ON
• PB mode
  75 % Color bars/XH5-1A2 (for NTSC)
  100 % Color bars/XH5-1AP2 (for PAL)
• VIDEO OUT select/MENU ; S VIDEO
 	
Connection 2
	S VIDEO (C) OUT (75 Ω terminated)
	
	TRIG : REF. VIDEO
	
	Spec. :
	[For NTSC]
	        A = 0.627 ±0.007 V p-p (87.7 ±1 IRE)
	[For PAL]
	        A = 0.885 ±0.006 V p-p
		⊘RV303/AVP-3/3P (B-3)
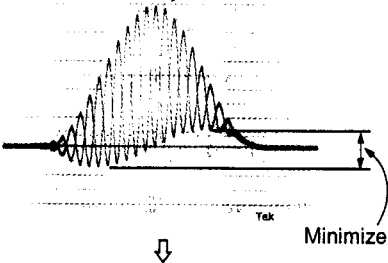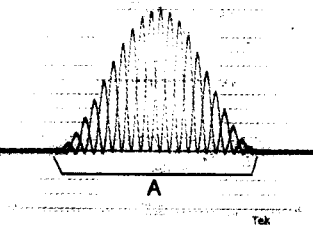
10-3-15. PB COMPOSITE C/C Delay Adjustment

Conditions for adjustment	Specification	Adjustment

Oscilloscope mode : INV + ADD
• PB mode
  Bowtie/XH5-1A2 or XH5-1AP2
  (02:00-02:30)
• VIDEO OUT select/MENU ; COMPOSITE
 	
Connection 2
	CH-1/Oscilloscope
	  TP101/AVP-3/3P (D-5)
	CH-2/Oscilloscope
	  TP102/AVP-3/3P (D-5)
	
	Spec. : A = Minimize
		⊘RV102/AVP-3/3P (G-4)

10-3-16. PB COMPOSITE Y/C Delay Adjustment

Conditions for adjustment	Specification	Adjustment
• PB mode Mod 12.5T/XH5-1A2 (07:50-08:20) or Mode 10T/XH-5-1AP2 (07:50-08:20) • VIDEO OUT select/MENU ; COMPOSITE	VIDEO OUT 1 (75 Ω terminated) TRIG : INT/WFM WFM 12.5T portion (for NTSC) 10T portion (for PAL) Before adjustment Minimize ⇩ After adjustment A	✪RV101/AVP-3/3P (F-4)
Connection 2	Spec. : Adjust until the portion "A" becomes flat.	

10-3-17. PB COMPONENT Y/C Delay Adjustment

[Connection for reference] Using for an oscilloscope

DSR-1500/1500P

```
Oscilloscope          (B)
         CH-2 ◄──┐    COMPONENT R-Y OUT
                 ├⋈┐
                 └─┤  COMPONENT B-Y OUT
                  (A)
         CH-1 ◄──────  COMPONENT Y OUT
```

INV/ADD mode   (A) ✪RV103
TRIG : CH-1   (B) ✪RV105

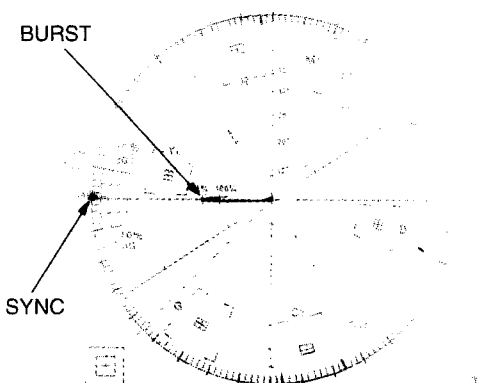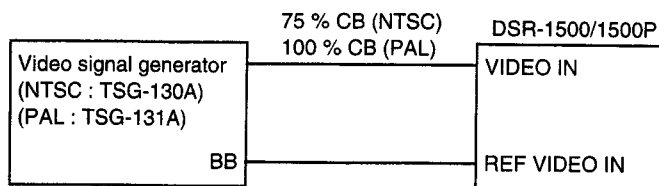| Conditions for adjustment	Specification	Adjustment
• PB mode Bowtie/XH5-1A2 or XH5-1AP2 (02:00-02:30) • VIDEO OUT select/MENU ; Y-R, B	COMPONENT OUT (75 Ω terminated) (A) B-Y Delay (B) R-Y Delay TRIG : INT/WFM Bowtie mode CH-1/CH-2 (A) CH-1/CH-3 (B) 0 ns 0 ns −20 ns +20 ns −20 ns +20 ns Spec. : Set the each Bowtie dip point of (A) and (B) on the center marker. 0 ±20 ns	✪RV103/AVP-3/3P (D-4) ✪RV105/AVP-3/3P (D-5)
Connection 1		

10-3-18. PB INT SCH Phase Adjustment
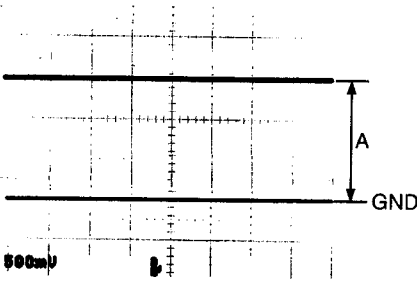
Conditions for adjustment	Specification	Adjustment

• PB mode
   75 % Color bars/XH5-1A2 (for NTSC)
   100 % Color bars/XH5-1AP2 (for PAL)
• REF. VIDEO INPUT ; No signal
• VIDEO OUT select/MENU ; COMPOSITE
	VIDEO OUT 1 (75 Ω terminated)
	
	(A) Burst Preset
	
	(B) INT SC
	
	TRIG : INT/WFM
	
	SCH mode
	
	Spec. : (A) Set the dot of the burst in the right position on the scale.
	(B) The SYNC should be in the same phase as the burst (SCH = 0 °).
		❷PHASE control/Vector
		❷RV402/AVP-3/3P (D-2)

• After adjustment is completed, re-connect the REF.VIDEO INPUT. Connection 2		
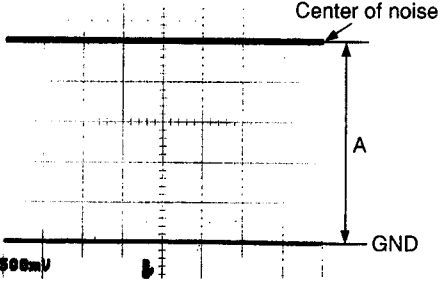
10-3-19. SPCK Error Adjustment
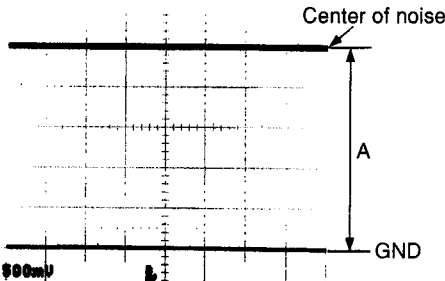
(Connection)

```
                                    75 % CB (NTSC)    DSR-1500/1500P
                                    100 % CB (PAL)   ┌──────────────────┐
 ┌───────────────────────────┐                       │ VIDEO IN         │
 │ Video signal generator    ├───────────────────────┤                  │
 │ (NTSC : TSG-130A)         │                       │                  │
 │ (PAL : TSG-131A)          │                       │                  │
 │                       BB  ├───────────────────────┤ REF VIDEO IN     │
 └───────────────────────────┘                       └──────────────────┘
```

Conditions for adjustment	Specification	Adjustment
Oscilloscope • EE mode • VIDEO IN ; 75 % Color bars (for NTSC) 100 % Color bars (for PAL)	TP500/DDE-15/15P (F-4) Spec. : A = 1.5 ±0.1 V dc	⊘CT500/DDE-15/15P (F-4)

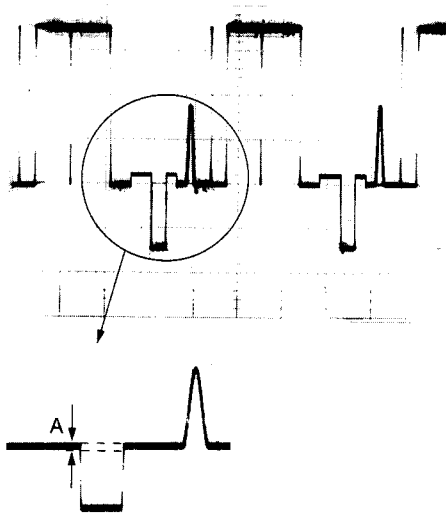## 10-3-20. COMPOSITE 4Fsc PLL DC Check/Adjustment

Conditions for adjustment	Specification	Adjustment
Oscilloscope • EE mode • VIDEO IN ; 75 % Color bars (for NTSC) 　　　　100 % Color bars (for PAL) • VIDEO IN select/MENU ; COMPOSITE	[Check] TP304/DDE-15/15P (F-5) Center of noise A GND 500mV Spec. : A = 2.5 ±0.5 V dc	
Connection 1	[Adjustment] TP303/DDE-15/15P (F-5) Center of noise A GND 500mV Spec. : A = 2.5 ±0.5 V dc	❷RV300/DDE-15/15P (F-5)
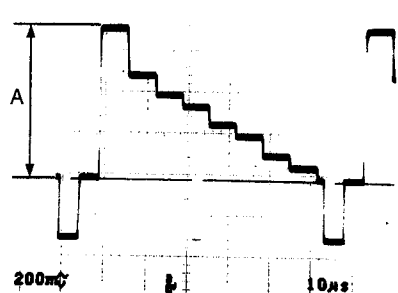
10-3-21. REC Y Clamp Level Adjustment

Conditions for adjustment	Specification	Adjustment
WFM or Oscilloscope • EE mode • COMPONENT IN ; Pluse & Bar • VIDEO OUT select/MENU ; Y-R, B Note Check that only NTSC MENU SETUP REMOVE ; OFF, SETUP ADD ; OFF Connection 1	COMPONENT Y OUT (75 Ω terminated) Spec. : A = Minimize the level difference A at setup.	❷RV403/DDE-15/15P (E-1)
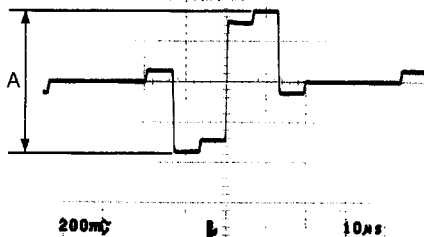
10-3-22. REC Y Level Adjustment
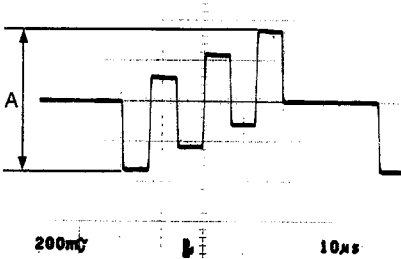
Conditions for adjustment	Specification	Adjustment
WFM or Oscilloscope • EE mode • COMPONENT IN ; 　　75 % Color bars (for NTSC) 　　100 % Color bars (for PAL) • VIDEO OUT select/MENU ; Y-R, B Connection 1	COMPONENT Y OUT (75 Ω terminated) TRIG : REF. VIDEO Spec. : [For NTSC] 　　A = 0.714 ±0.007 V (100 ±1 IRE) [For PAL] 　　A = 0.700 ±0.007 V	❷RV400/DDE-15/15P (D-1)

10-3-23. REC COMPONENT R-Y Level Adjustment

Conditions for adjustment	Specification	Adjustment

WFM or Oscilloscope
• EE mode
• COMPONENT IN ;
        75 % Color bars (for NTSC)
        100 % Color bars (for PAL)
• VIDEO OUT select/MENU ; Y-R, B
 	
Connection 1
	COMPONENT R-Y OUT (75 Ω terminated)
	
	TRIG : REF. VIDEO
	
	Spec. :
	[For NTSC]
	    A = 0.700 ±0.007 V p-p (98 ±1 IRE)
	[For PAL]
	    A = 0.700 ±0.007 V p-p
		❷RV402/DDE-15/15P
		(D-3)

10-3-24. REC COMPONENT B-Y Level Adjustment

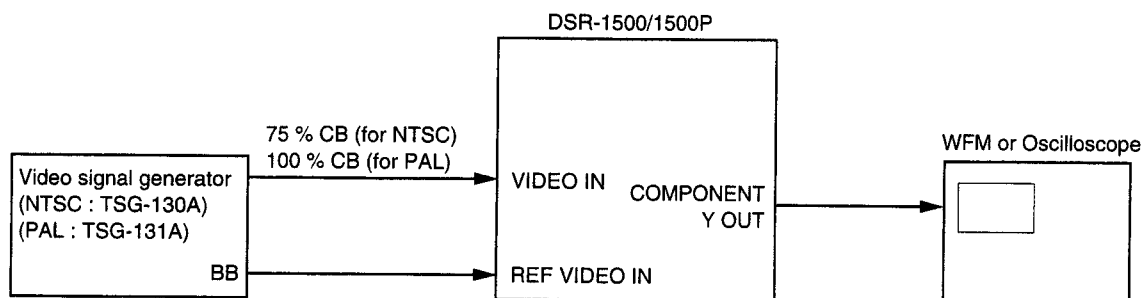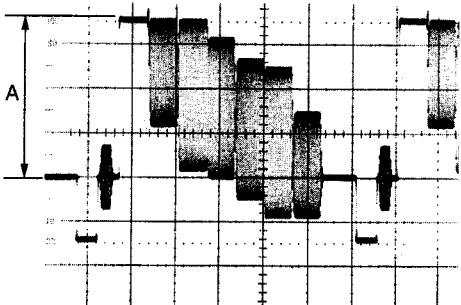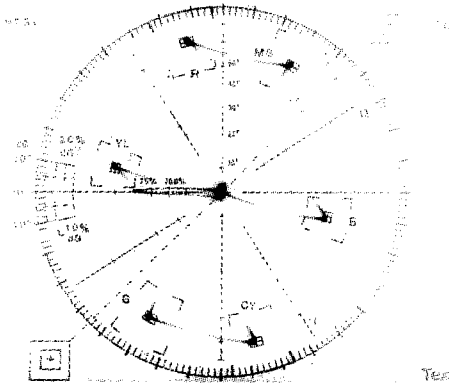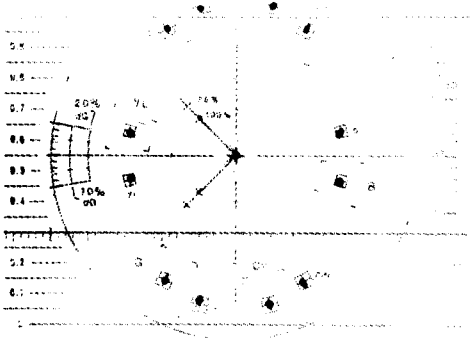| Conditions for adjustment	Specification	Adjustment

WFM or Oscilloscope
• EE mode
• COMPONENT IN ;
        75 % Color bars (for NTSC)
        100 % Color bars (for PAL)
• VIDEO OUT select/MENU ; Y-R, B
 	
Connection 1
	COMPONENT B-Y OUT (75 Ω terminated)
	
	TRIG : REF. VIDEO
	
	Spec. :
	[For NTSC]
	    A = 0.700 ±0.007 V p-p (98 ±1 IRE)
	[For PAL]
	    A = 0.700 ±0.007 V p-p
		❷RV401/DDE-15/15P
		(D-2)

10-3-25. REC A/D Y Level Adjustment

(Connection)

DSR-1500/1500P

```
                                           DSR-1500/1500P
                                    ┌──────────────────────┐
                                    │                      │          WFM or Oscilloscope
  ┌────────────────────┐  75 % CB (for NTSC)               │        ┌──────────────────┐
  │ Video signal generator │ 100 % CB (for PAL)            │        │   ┌──────────┐   │
  │ (NTSC : TSG-130A)  │────────────▶│ VIDEO IN  COMPONENT │───────▶│   │          │   │
  │ (PAL : TSG-131A)   │             │              Y OUT  │        │   └──────────┘   │
  │                BB  │────────────▶│ REF VIDEO IN         │        └──────────────────┘
  └────────────────────┘             └──────────────────────┘
```

Conditions for adjustment	Specification	Adjustment
WFM or Oscilloscope • EE mode • VIDEO IN ; 75 % Color bars (for NTSC) 　　　　　100 % Color bars (for PAL) • VIDEO IN select/MENU ; COMPOSITE • S400-1/SSS-10 (D-1) ; ON • S200/DDE-15/15P (A-5) ; ON • VIDEO OUT select/MENU ; Y-R, B • After Adjustment, S400-1, S200 ; OFF	COMPONENT Y OUT (75 Ω terminated) TRIG : REF. VIDEO ↓A (Coincide) 200mV　　　　　10μs Spec. : [For NTSC] 　　A = 0 ±0.007 V (0 ±1 IRE) [For PAL] 　　A = 0 ±0.007 V	❷RV100/DDE-15/15P (B-3)

10-3-26. REC COMPOSITE Y Level Adjustment

Conditions for adjustment	Specification	Adjustment

WFM or Oscilloscope
• EE mode
• VIDEO IN ; 75 % Color bars (for NTSC)
              100 % Color bars (for PAL)
• VIDEO IN select/MENU ; COMPOSITE
• VIDEO OUT select/MENU ; COMPOSITE
 	
Connection 2
	VIDEO OUT 1 (75 Ω terminated)
	
	TRIG : REF. VIDEO
	
	Spec. :
	[For NTSC]
	      A = 0.714 ±0.007 V (100 ±1 IRE)
	[For PAL]
	      A = 0.700 ±0.007 V
		❷RV200/DDE-15/15P
		(C-3)
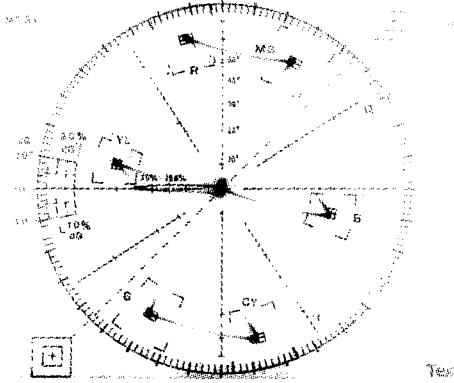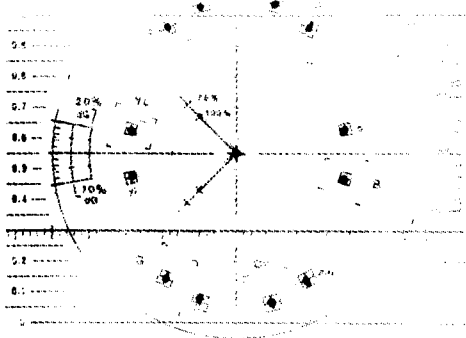
10-3-27. REC COMPOSITE Chroma Level Adjustment

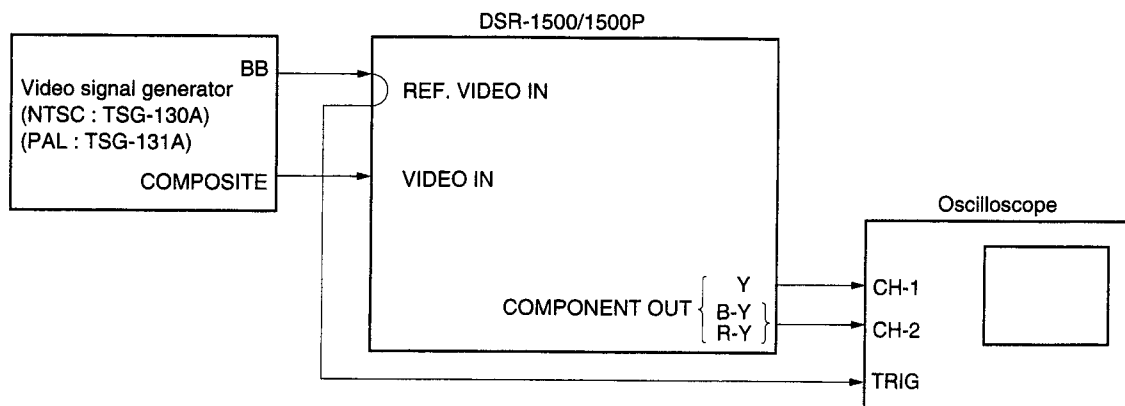| Conditions for adjustment	Specification	Adjustment

• EE mode
• VIDEO IN ; 75 % Color bars (for NTSC)
           100 % Color bars (for PAL)
• VIDEO IN select/MENU ; COMPOSITE
• VIDEO OUT select/MENU ; COMPOSITE
 	
Note
The "Setup ON/OFF" setting of the DSR-1500/1500P and that a vectorscope must have been set to the same position beforehand.
 	
Connection 2
	VIDEO OUT 1 (75 Ω terminated)
	
	(A) Burst
	(B) Composite Chroma Level
	
	TRIG : REF. VIDEO
	
	Vector (for NTSC)
	
	Vector (for PAL)
	
	Spec. : (A) Set the dot of the burst in the right position on the scale.
	(B) All dots should be inside the "⊞" mark on the vector.
		❷PHASE control/Vector
		❷RV201/DDE-15/15P
		   (C-3)
		❷RV202/DDE-15/15P
		   (C-4)

10-3-28. REC S VIDEO Chroma Level Check

Conditions for adjustment	Specification	Adjustment

• EE mode
• S VIDEO IN ; 75 % Color bars (for NTSC)
          100 % Color bars (for PAL)
• VIDEO IN select/MENU ; S VIDEO
• VIDEO OUT select/MENU ; S VIDEO
 	
Note
The "Setup ON/OFF" setting of the DSR-1500/1500P and that a vectorscope must have been set to the same position beforehand.
	S VIDEO (C) OUT (75 Ω terminated)
	
	(A) Burst
	(B) S-C Level
	
	TRIG : REF. VIDEO
	
	Vector (for NTSC)
	
	Vector (for PAL)
	
		❷PHASE control/Vector
		❷RV101/DDE-15/15P
		  (A-2)

Connection 2	Spec. : (A) The dot indicating the burst signal should be positioned at the specified spot on the vectorscope scale. (B) All dots should be positioned inside the "⊞" mark on the vector. If the signal does not satisfy the specifications, adjust RV101/DDE-15/15P (A-2).	

10-3-29. REC COMPOSITE Y/C Delay Adjustment

(Connection)

Conditions for adjustment	Specification	Adjustment

• EE mode
• VIDEO IN ; 75 % Color bars (for NTSC)
           100 % Color bars (for PAL)
• VIDEO IN select/MENU ; COMPOSITE
• VIDEO OUT select/MENU ; Y-R, B
	COMPONENT OUT (75 Ω terminated)
	
	B-Y
	
	200mV 200mV 10µs
	A portion
	
	R-Y
	
	200mV 200mV 10µs
	A portion
	
	(Detail of A portion)
	
	Spec. : 0 ±20 ns
		B-Y : ❷RV404/DDE-15/
		      15P (D-2)
		R-Y : ❷RV407/DDE-15/
		      15P (D-2)

10-3-30. REC COMPONENT Y/C Delay Adjustment

[Connection for reference] Using for an oscilloscope

DSR-1500/1500P

```
                          (B)
                           o      COMPONENT R-Y OUT
         CH-2 ◄─────── ×
                           o      COMPONENT B-Y OUT
  Oscilloscope            (A)
         CH-1 ◄───────────────    COMPONENT Y OUT
```

INV/ADD mode   (A) ⊘RV406
TRIG : CH-1   (B) ⊘RV409

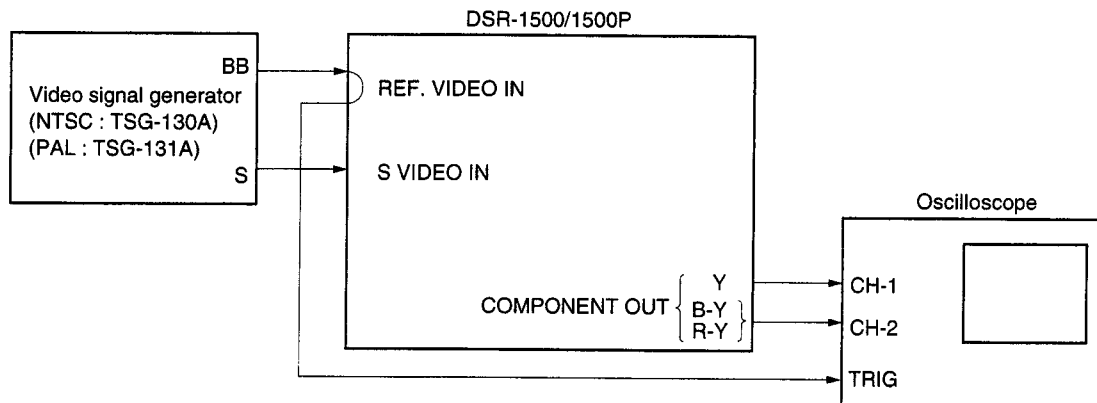| Conditions for adjustment	Specification	Adjustment
· EE mode · COMPONENT IN ; Bowtie · VIDEO OUT select/MENU ; Y-R, B Connection 1	COMPONENT OUT (75 Ω terminated) (A) B-Y Delay (B) R-Y Delay TRIG : INT/WFM Bowtie mode CH-1/CH-2 (A) CH-1/CH-3 (B) 0 ns 0 ns −20 ns +20 ns −20 ns +20 ns Spec. : Set the each Bowtie dip point of (A) and (B) on the center marker. 0 ±20 ns	⊘RV406/DDE-15/15P (D-2) ⊘RV409/DDE-15/15P (D-2)

10-3-31. REC S VIDEO Y/C Delay Adjustment

(Connection)

Conditions for adjustment	Specification	Adjustment

• EE mode
• S VIDEO IN ; 75 % Color bars (for NTSC)
               100 % Color bars (for PAL)
• VIDEO IN select/MENU ; S VIDEO
• VIDEO OUT select/MENU ; Y-R, B
	COMPONENT OUT (75 Ω terminated)
	
	B-Y
	
	200mV 200mV 10µs
	A portion
	
	R-Y
	
	200mV 200mV 10µs
	A portion
	
	(Detail of A portion)
	
	Spec. : 0 ±20 ns
		B-Y : ❷RV405/DDE-15/
		       15P (D-2)
		R-Y : ❷RV408/DDE-15/
		       15P (D-2)

10-4. SDI/SDTI

10-4-1. Free Run Adjustment

(Connection)
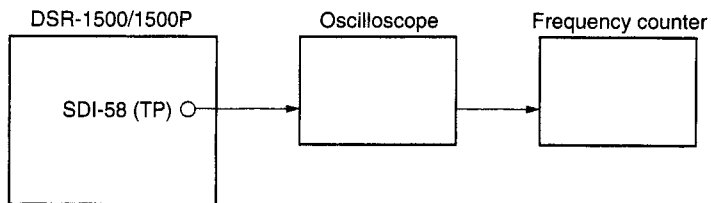
Conditions for adjustment	Specification	Adjustment
Step 1 • E-E mode • Connect jumper wire between TP101/ SDI-58 (A-7) and E101/SDI-58 (A-7). • After adjustment, remove jumper wire.	TP102/SDI-58 (B-7) Spec. : 27.0 ±0.1 MHz	⊘RV101/SDI-58 (A-7)
Step 2 • E-E mode • Connect jumper wire between TP502/ SDI-58 (E-2) and E101/SDI-58 (A-7). • After adjustment, remove jumper wire.	TP501/SDI-58 (A-5) Spec. : 27.0 ±0.1 MHz	⊘RV501/SDI-58 (B-7)

10-5. Adjustment Related Parts Layout Diagram

AVP-3/3P board (A side)

```
     A    |   B   |   C   |   D   |    E    |   F   |   G   |   H
1                                    RV500
                              TP500 □    □□ TP504
                              RV501  TP502
2                                ● RV402
                                 ● RV401
        ● RV307
        ● RV300
3
     RV304 ●  ● RV306
     RV303 ●
4                RV204  RV104          ●      ●
                                    RV101   RV102
        ●        RV203    ● ●
     RV305       ●       RV103
                RV201 ●  □ TP101
5    RV200 ●
        ●       ● ● RV105
     RV202     RV106
                 □
               TP102
6
              RV601
                ●
7
              RV602
                ●
8
```
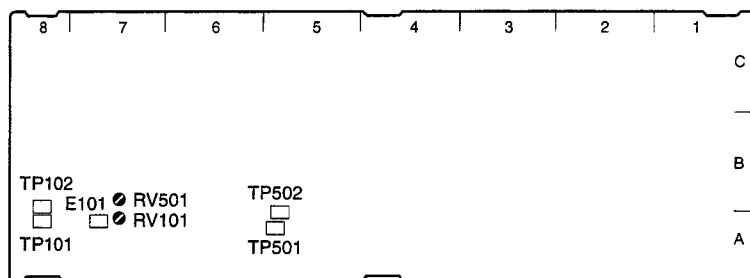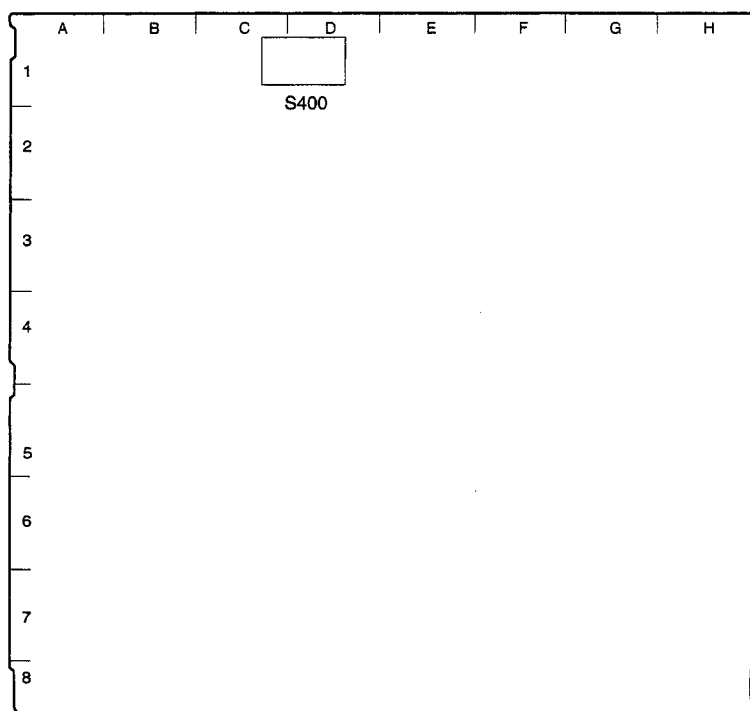
DDE-15/15P board (A side)

```
     A    |   B   |   C   |   D   |    E    |   F   |   G   |   H
1                         ●          ●
                        RV400      RV403
2                  RV405  RV401
     ● RV101    RV404 —●●● ●— RV406
                  RV408 —●●●— RV407
                   RV409  RV402
3    RV100 ●          ●
        RV200 ●
        RV201 ●
4          ●              TP500
         RV202              □
                        TP303
                          □
     □ S200        RV300 ●   TP304
5                            □
6          RV700
             ●
7          RV701
             ●
8
```
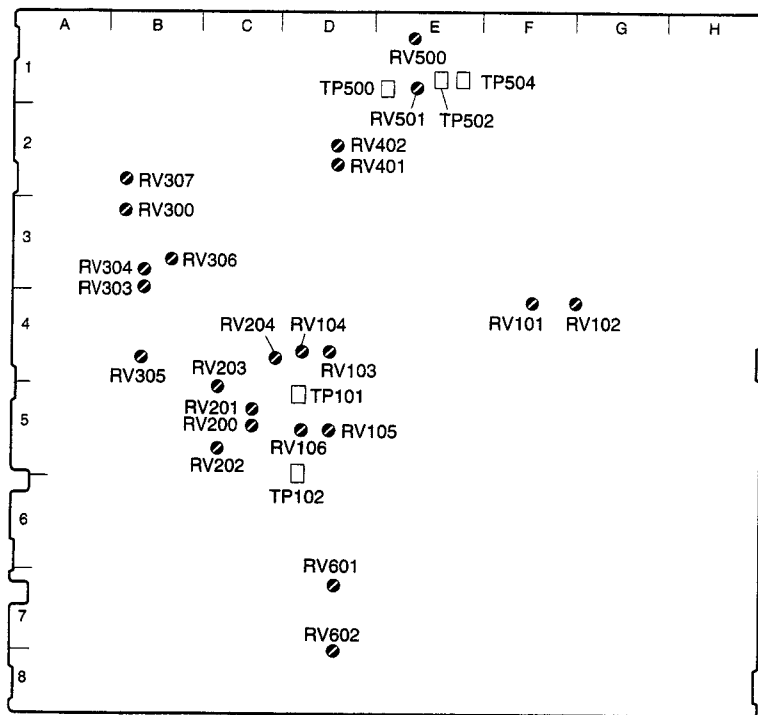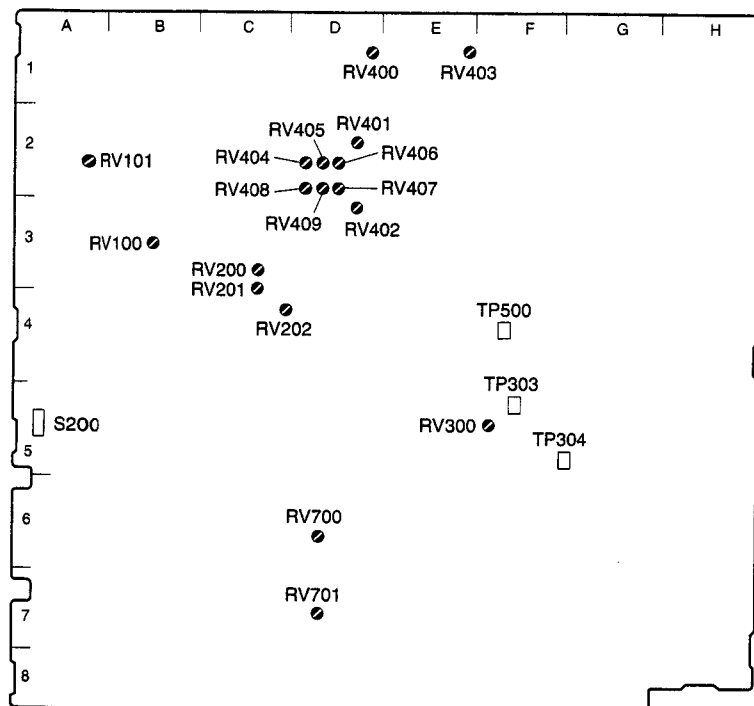
SDI-58 board (A side)
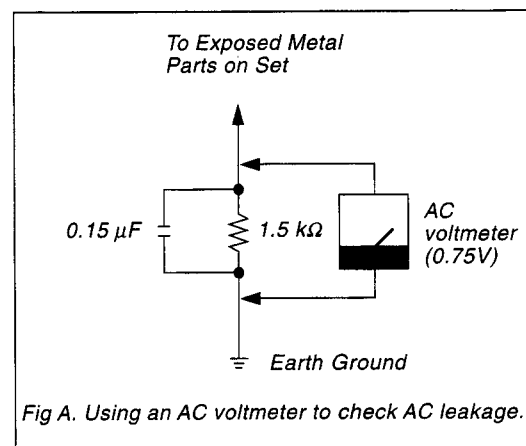

SSS-10 (A side)

S400

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

To Exposed Metal Parts on Set

$0.15\,\mu F$ $1.5\,k\Omega$ AC voltmeter (0.75V)

Earth Ground

Fig A. Using an AC voltmeter to check AC leakage.